

CA26N

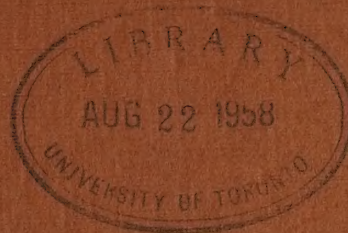
Z1

-22H101

#116K

116

COPY FOR MR. J. ALLAN ROSS



HYDRO-ELECTRIC INQUIRY COMMISSION

## ENGINEERING DATA

THE QUEENSTON-CHIPPAWA POWER DEVELOPMENT

CHAPTER "K"—COSTS  
ANALYSIS OF EXPENDITURES  
TO MARCH 31, 1922

WALTER J. FRANCIS & COMPANY


CONSULTING ENGINEERS











Digitized by the Internet Archive  
in 2023 with funding from  
University of Toronto

<https://archive.org/details/31761119697878>













## INDEX TO CHAPTER K.

Analysis of Expenditures Section

Subject	Page
Analysis of Expenditures .....	K-57
The Form of the Analysis .....	K-57
Total Expenditure on Project .....	K-58
Diagrams .....	K-58
Expenditure on Canal .....	K-58
Tables .....	K-59
Expenditure on Piers, Locks and Railroad .....	K-59
Expenditure on Penstocks, Power House and Tailrace .....	K-59
Subdivision of the Tables .....	K-92
Direct Costs .....	K-92
Field Service Costs .....	K-95
Field Overhead Costs .....	K-96
Construction Interest .....	K-96
Direct Costs, Field Service Costs, Field Overhead .....	K-97
Costs and Construction Interest .....	K-97
Administrative Field Overhead Costs .....	K-97
Head Office Overhead Costs .....	K-98
Unwatering .....	K-99
Contingencies (Strike) .....	K-99
Hospital and Medical Services .....	K-100
Main Line Railways and Roads .....	K-100
Miscellaneous Items .....	K-100
Grand Total of All Expenditures .....	K-102
Expenditure on Miscellaneous Items .....	K-101
Unit Costs .....	K-102
Tables .....	
The Records of Labour and Material Costs .....	K-102
Direct, Field Service, and Field Overhead Costs, and .....	
Summary .....	K-103
Administrative Field Overhead Costs .....	K-104
Head Office Overhead Costs .....	K-105
Unwatering, Contingencies, Hospital and Medical Services, .....	
Main Line Railways and Roads and Miscellaneous Items .....	K-106
Details of Direct Costs .....	K-107
Details of Field Service Costs .....	K-108
Details of Field Overhead Costs and Construction Interest .....	K-109
Details of Administrative Field Overhead Costs .....	K-110
Details of Head Office Overhead Costs .....	K-111
Details of Head Office Overhead Costs (Continued) .....	K-112



(X-Index)

## INDEX TO CHAPTER K.

Analysis of Expenditures Section

Page	Subject
K-103	Summary .....
K-102	The Records of Labor and Material Costs .....
K-102	Unit Costs .....
K-102	Grand Total of All Expenditures .....
K-100	Miscellaneous Items .....
K-100	Main Line Railways and Roads .....
K-100	Hospital and Medical Services .....
K-99	Contingencies (Strike) .....
K-99	Unsettling .....
K-98	Head Office Overhead Costs .....
K-97	Administrative Field Overhead Costs .....
K-97	Costs and Construction Interest .....
K-96	Direct Costs, Field Service Costs, Field Overhead
K-96	Construction Interest .....
K-96	Field Overhead Costs .....
K-95	Field Service Costs .....
K-95	Direct Costs .....
K-93	Subdivision of the Tables .....
K-92	Tables .....
K-92	Diagrams .....
K-87	The Form of the Analysis .....
K-87	Analysis of Expenditures .....



## LIST OF ILLUSTRATIONS

Analysis of Expenditures Section

Subject	Page
<u>Diagrams</u>	
Costs by Construction Elements:	
Total Expenditure on Project .....	K-63
Expenditure on Intake and Welland River .....	K-64
Expenditure on Canal .....	K-65
Expenditure on Forebay and Screen House .....	K-66
Expenditure on Penstocks, Power House and Tailrace .....	K-67
Expenditure on Hydraulic Machinery - Electrical Generation .....	K-68
Expenditure on Bridges .....	K-69
Costs by Classification:	
Total Expenditure on Project .....	K-70
Expenditure on Intake .....	K-71
Expenditure on River .....	K-72
Expenditure on Canal .....	K-73
Expenditure on Forebay .....	K-74
Expenditure on Screen House .....	K-75
Expenditure on Penstocks .....	K-76
Expenditure on Power House and Tailrace .....	K-77
Expenditure on Hydraulic Machinery .....	K-78
Expenditure on Electrical Generation, etc. ....	K-79
Expenditure on Bridges .....	K-80
Expenditure on Miscellaneous Items .....	K-81
<u>Tables</u>	
Grand Total of All Expenditures .....	K-82
Direct, Field Service, and Field Overhead Costs, and Construction Interest .....	K-83
Administrative Field Overhead Costs .....	K-84
Head Office Overhead Costs .....	K-85
Unwatering, Contingencies, Hospital and Medical Services, Main Line Railways and Roads and Miscellaneous Items ...	K-86
Details of Direct Costs .....	K-87
Details of Field Service Costs .....	K-88
Details of Field Overhead Costs and Construction Interest .	K-89
Details of Administrative Field Overhead Costs .....	K-90
Details of Head Office Overhead Costs .....	K-91
Details of Head Office Overhead Costs (Continued) .....	K-91a

1992

1990-1991

Expenditure on Penstock, Power House and Tailrace .....  
Expenditure on Forebay and Power House .....  
Expenditure on Penstock, Power House and Tailrace .....  
Expenditure on Forebay and Power House .....  
Expenditure on Penstock, Power House and Tailrace .....  
Expenditure on Forebay and Power House .....

Y903

EXPANDITORS ON HYDRAULIC MACHINERY  
EXPANDITORS ON POWER HOSES AND TUBING  
EXPANDITORS ON PNEUMATIC  
EXPANDITORS ON GASEOUS HOSES  
EXPANDITORS ON LIQUID HOSES

1-1	Details of Head Office Overhead Costs (Continued)	1-1
1-2	Details of Head Office Overhead Costs	1-2
1-3	Details of Administrative Field Overhead Costs	1-3
1-4	Details of Field Service Costs	1-4
1-5	Details of Direct Costs	1-5
1-6	Details of Indirect Costs	1-6
1-7	Details of Field Service Costs	1-7
1-8	Details of Administrative Field Overhead Costs	1-8
1-9	Details of Field Service Costs	1-9
1-10	Details of Direct Costs	1-10
1-11	Details of Indirect Costs	1-11
1-12	Details of Field Service Costs	1-12
1-13	Details of Administrative Field Overhead Costs	1-13
1-14	Details of Field Service Costs	1-14
1-15	Details of Direct Costs	1-15
1-16	Details of Indirect Costs	1-16
1-17	Details of Field Service Costs	1-17
1-18	Details of Administrative Field Overhead Costs	1-18
1-19	Details of Field Service Costs	1-19
1-20	Details of Direct Costs	1-20
1-21	Details of Indirect Costs	1-21
1-22	Details of Field Service Costs	1-22
1-23	Details of Administrative Field Overhead Costs	1-23
1-24	Details of Field Service Costs	1-24
1-25	Details of Direct Costs	1-25
1-26	Details of Indirect Costs	1-26
1-27	Details of Field Service Costs	1-27
1-28	Details of Administrative Field Overhead Costs	1-28
1-29	Details of Field Service Costs	1-29
1-30	Details of Direct Costs	1-30
1-31	Details of Indirect Costs	1-31
1-32	Details of Field Service Costs	1-32
1-33	Details of Administrative Field Overhead Costs	1-33
1-34	Details of Field Service Costs	1-34
1-35	Details of Direct Costs	1-35
1-36	Details of Indirect Costs	1-36
1-37	Details of Field Service Costs	1-37
1-38	Details of Administrative Field Overhead Costs	1-38
1-39	Details of Field Service Costs	1-39
1-40	Details of Direct Costs	1-40
1-41	Details of Indirect Costs	1-41
1-42	Details of Field Service Costs	1-42
1-43	Details of Administrative Field Overhead Costs	1-43
1-44	Details of Field Service Costs	1-44
1-45	Details of Direct Costs	1-45
1-46	Details of Indirect Costs	1-46
1-47	Details of Field Service Costs	1-47
1-48	Details of Administrative Field Overhead Costs	1-48
1-49	Details of Field Service Costs	1-49
1-50	Details of Direct Costs	1-50
1-51	Details of Indirect Costs	1-51
1-52	Details of Field Service Costs	1-52
1-53	Details of Administrative Field Overhead Costs	1-53
1-54	Details of Field Service Costs	1-54
1-55	Details of Direct Costs	1-55
1-56	Details of Indirect Costs	1-56
1-57	Details of Field Service Costs	1-57
1-58	Details of Administrative Field Overhead Costs	1-58
1-59	Details of Field Service Costs	1-59
1-60	Details of Direct Costs	1-60
1-61	Details of Indirect Costs	1-61
1-62	Details of Field Service Costs	1-62
1-63	Details of Administrative Field Overhead Costs	1-63
1-64	Details of Field Service Costs	1-64
1-65	Details of Direct Costs	1-65
1-66	Details of Indirect Costs	1-66
1-67	Details of Field Service Costs	1-67
1-68	Details of Administrative Field Overhead Costs	1-68
1-69	Details of Field Service Costs	1-69
1-70	Details of Direct Costs	1-70
1-71	Details of Indirect Costs	1-71
1-72	Details of Field Service Costs	1-72
1-73	Details of Administrative Field Overhead Costs	1-73
1-74	Details of Field Service Costs	1-74
1-75	Details of Direct Costs	1-75
1-76	Details of Indirect Costs	1-76
1-77	Details of Field Service Costs	1-77
1-78	Details of Administrative Field Overhead Costs	1-78
1-79	Details of Field Service Costs	1-79
1-80	Details of Direct Costs	1-80
1-81	Details of Indirect Costs	1-81
1-82	Details of Field Service Costs	1-82
1-83	Details of Administrative Field Overhead Costs	1-83
1-84	Details of Field Service Costs	1-84
1-85	Details of Direct Costs	1-85
1-86	Details of Indirect Costs	1-86
1-87	Details of Field Service Costs	1-87
1-88	Details of Administrative Field Overhead Costs	1-88
1-89	Details of Field Service Costs	1-89
1-90	Details of Direct Costs	1-90
1-91	Details of Indirect Costs	1-91
1-92	Details of Field Service Costs	1-92
1-93	Details of Administrative Field Overhead Costs	1-93
1-94	Details of Field Service Costs	1-94
1-95	Details of Direct Costs	1-95
1-96	Details of Indirect Costs	1-96
1-97	Details of Field Service Costs	1-97
1-98	Details of Administrative Field Overhead Costs	1-98
1-99	Details of Field Service Costs	1-99
1-100	Details of Direct Costs	1-100
1-101	Details of Indirect Costs	1-101
1-102	Details of Field Service Costs	1-102
1-103	Details of Administrative Field Overhead Costs	1-103
1-104	Details of Field Service Costs	1-104
1-105	Details of Direct Costs	1-105
1-106	Details of Indirect Costs	1-106
1-107	Details of Field Service Costs	1-107



Board of Directors of the Commission in Chapter K. There are expenditures of  
about a very close approximation to it is also stated that the expenditures  
will be increased in that year.

#### COSTS

Walter J. Francis.

The first part of Chapter K was devoted to an analysis of the estimates of  
the cost of the Queenston-Chippawa Power Development and, incidentally, to the  
"estimates" or requests to the Ontario Government for appropriations to carry  
on the general works of the Hydro-Electric Power Commission of Ontario. This  
part of Chapter K, being the second, and self-contained, is devoted to an  
analysis of the expenditures on the Queenston-Chippawa Power Development.

#### Analysis of Expenditures.

##### The Form of the Analysis.

The form in which the analysis of expenditures on the Queenston-Chippawa  
Power Development, as at March 31st, 1922, has been made consists of a series  
of diagrams or charts, being pages K-63 to K-81, and a set of tables included  
as pages K-82 to K-91 hereof, together with the explanatory text.

The total expenditure on the Queenston-Chippawa Power Development up to  
March 31st, 1922, was \$62,182,623.65. This sum of money is fully recorded on  
the books of the Hydro-Electric Power Commission at Niagara Falls, and has been  
arrived at from the record of payments made for labour, material and all other  
expenses incurred in carrying out the work up to that date. The records of the





Head Office of the Commission at Toronto show an expenditure of \$62,182,210.96, being a very close agreement when it is appreciated that the undertaking was still in progress at that date.

The total expenditure of \$62,182,623.65 has been analysed and allocated into the component parts of the development. The reports dealing with the descriptions of the Queenston-Chippawa Power Development which have been made from time to time have referred to the elements of construction. These elements have been adhered to in the analysis, and to them have been added certain other general items, such as Right-of-Way, and Bridges. The Queenston-Power House Railway has also been considered as an element for this purpose. In addition, such factors as Plant Salvage, Stores, Salvaging Expenditures, Miscellaneous Sales, Suspense Account and Bond Interest are also taken into consideration. The expenditures embrace everything up to and including the 12,000-volt switching apparatus in the Power House, but exclusive of the high-tension transformers and other high-tension apparatus and the housing therefor.

#### Diagrams.

The diagrams or charts have been arranged in two series, the first being a representation of the Costs according to the Construction Elements of the project, and the second a representation of the Costs according to the Classification of Work in the various elements. The series devoted to the costs taken according to construction elements commences with a representation of the total expenditure on the project on page K-63, and concludes with a representation of expenditure on each of the elements of the project, element by element.





following the order already observed in the previous reports, and being pages K-64 to K-69 inclusive. The series devoted to the costs taken according to classification of the work, twelve in all, commences with a diagram, page K-70, showing the total expenditure on the project taken according to the classification. It is followed by pages K-71 to K-81, representing the expenditures on the various elements of the project according to the classification of the work. The Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, total

#### Tables.

the administrative field overhead costs.

Following in order are ten tables, being a summarization of the totals from this table may be said to be arranged as closely as practicable the work which the above mentioned diagrams were plotted. The tables also give the unit field engineering and superintending costs derived from the totals. The identifying numerals at the top of the columns are the same throughout the series, so that a column may be referred to by number for the sake of convenience in reference.

The Queenston-Chippawa Power Development to March 31st, 1922, arranged with

The first table, being page K-82, gives the Grand Total of All Expenditures on the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, total quantities in the work, and the total costs item by item. This table is simply a subdivision of the gross total.

The second table, being page K-83, gives the Direct Costs, Field Service Costs, Field Overhead Costs and Construction Interest on the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, total quantities in the work and the unit costs derived therefrom and applicable to the direct costs, field service





costs, field overhead costs and construction interest combined.

This table may be said to correspond as far as practicable with the totals which would have obtained under the terms of an assumed general contract, and the unit costs derived therefrom and applicable thereto.

The third table, being page K-84, gives the Administrative Field Overhead Costs of the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, total quantities in the work and the unit costs derived therefrom and applicable to the administrative field overhead costs.

This table may be said to represent as closely as practicable the owner's field engineering and supervision costs under the terms of an assumed general contract, and the proportion applicable therefrom to the unit costs.

The fourth table, being page K-85, gives the Head Office Overhead Costs of the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, total quantities in the work and the unit costs derived therefrom and applicable to the head office overhead costs.

This table may be said to represent as closely as practicable the owner's head office overhead costs under the terms of an assumed general contract, and the proportion applicable therefrom to the unit costs.

The fifth table, being page K-86, gives the costs for the Unwatering, Contingencies, Hospital and Medical Services, Main Line Railways and Roads, and Miscellaneous Items of the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.

The following information is being furnished to you for your information and use. This information is being furnished to you for your information and use. This information is being furnished to you for your information and use.



classification of work, total quantities in the work under each of the above items, the total cost for each of the above items and the unit costs derived therefrom.

This table is a grouping of the miscellaneous principal items not included in the three tables immediately preceding, following the usual Government custom of considering them separately.

The sixth table, being page K-37, gives the Details of the Direct Costs of the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, and the total quantities in the work, subdivided into four parts, namely: (1), materials and permanent machinery; (2), labour; (3), plant; and (4), construction superintendence, with the total costs and the unit costs derived therefrom for each of the subdivisions.

The seventh table, being page K-38, gives the Details of the Field Service Costs of the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, and the total quantities in the work, subdivided into seven parts, namely: (5), power, light and telephone; (6), compressed air; (7), water supply; (8), garage and stables; (9), sanitation and camps; (10), plant repairs; (11), miscellaneous, with the total costs and the unit costs derived therefrom for each of the subdivisions.

The eighth table, being page K-39, gives the Details of Field Overhead Costs and Construction Interest on the Queenston-Chippawa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the

SECRET

It is the policy of the Department of the Interior to provide for the maximum protection of the public interest in the disposal of the public lands. This policy is based on the principle that the public lands are the property of the people and should be managed for their benefit. The Department of the Interior is committed to the responsible management of the public lands and to the protection of the public interest in their disposal.

of the subdivisions.

11/11/11

For more information, please contact the author at the address above.



The ninth table, being page X-90, gives the Details of Administrative Field Overhead Costs of the Queenston-Chippewa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, and the total quantities in the work, subdivided into five parts, namely: (17), office engineering; (18), field engineering; (19), cost-keeping; (20), accounting; (21), stenography, with the total costs and the unit costs derived therefrom for each of the subdivisions.

The tenth table, being pages K-91 and K-91a, gives the Details of Head Office Overhead Costs on the Queenston-Chippewa Power Development to March 31st, 1922, arranged with regard to the elements of the project, the classification of work, and the total quantities in the work, subdivided into fifteen parts, namely: (23), executive salaries and expenses; (24), officers' and assistants' salaries and expenses; (25), general expense, head office maintenance; (26), office engineering; (27), field engineering; (28), consulting services; (29), field superintendence; (30), purchasing; (31), timekeeping; (32), cost-keeping; (33), accounting; (34), auditing; (35), stenography; (36), laboratories; (37), insurance and taxes, with the total costs and the unit costs derived therefrom for each of the subdivisions.

NEWSTON  
POWER

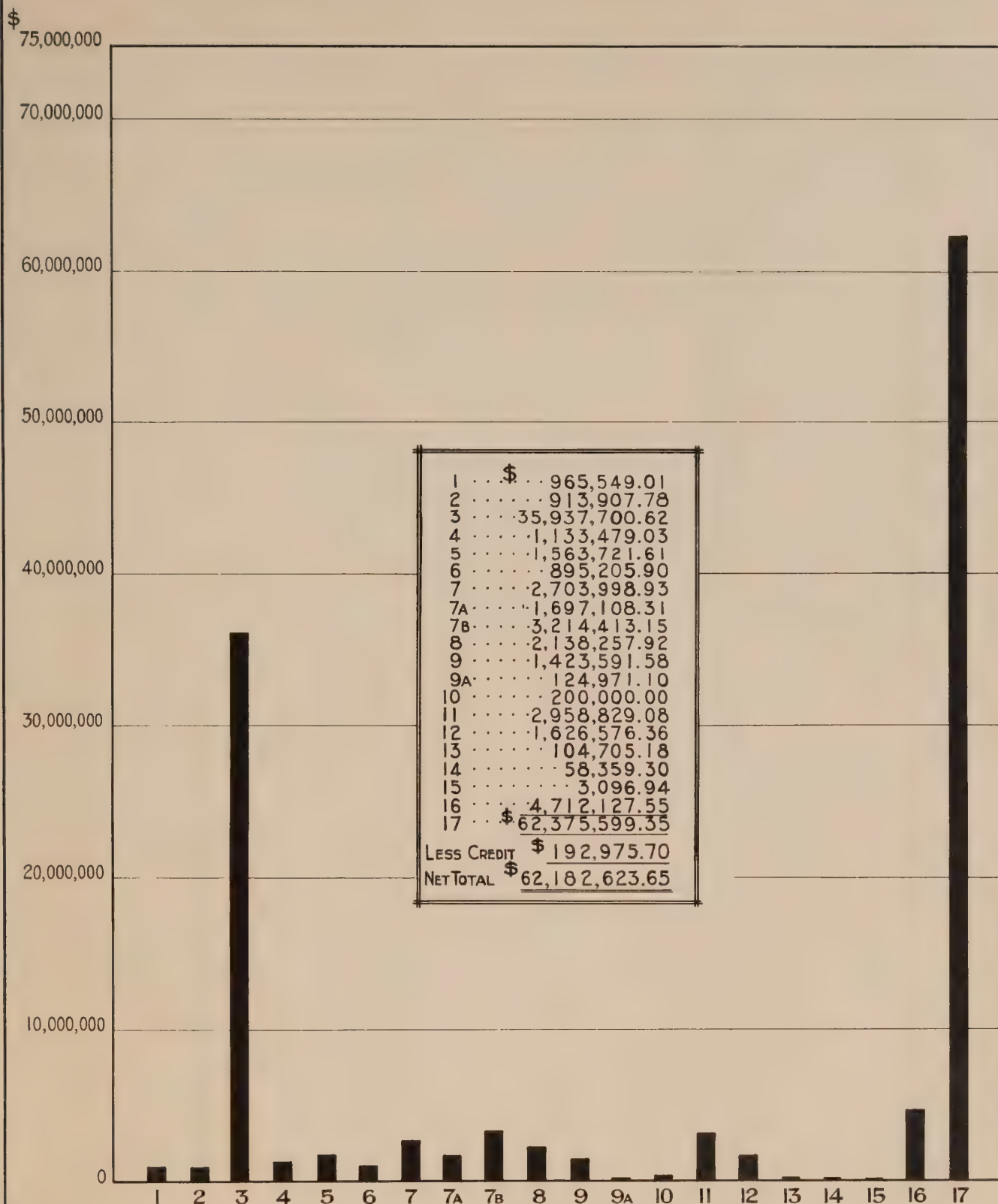
TOTAL EXPENDITURE ON PROJECT

and the total population in the work, subdivided into

The first table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The second table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The third table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The fourth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The fifth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The sixth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The seventh table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The eighth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The ninth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books. The tenth table, which was 10-12 inches long and 4-6 inches wide, was made of wood and was used for the purpose of holding the books.

THE STATE OF TEXAS, County of \_\_\_\_\_, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears on the records of the County Clerk of said County.



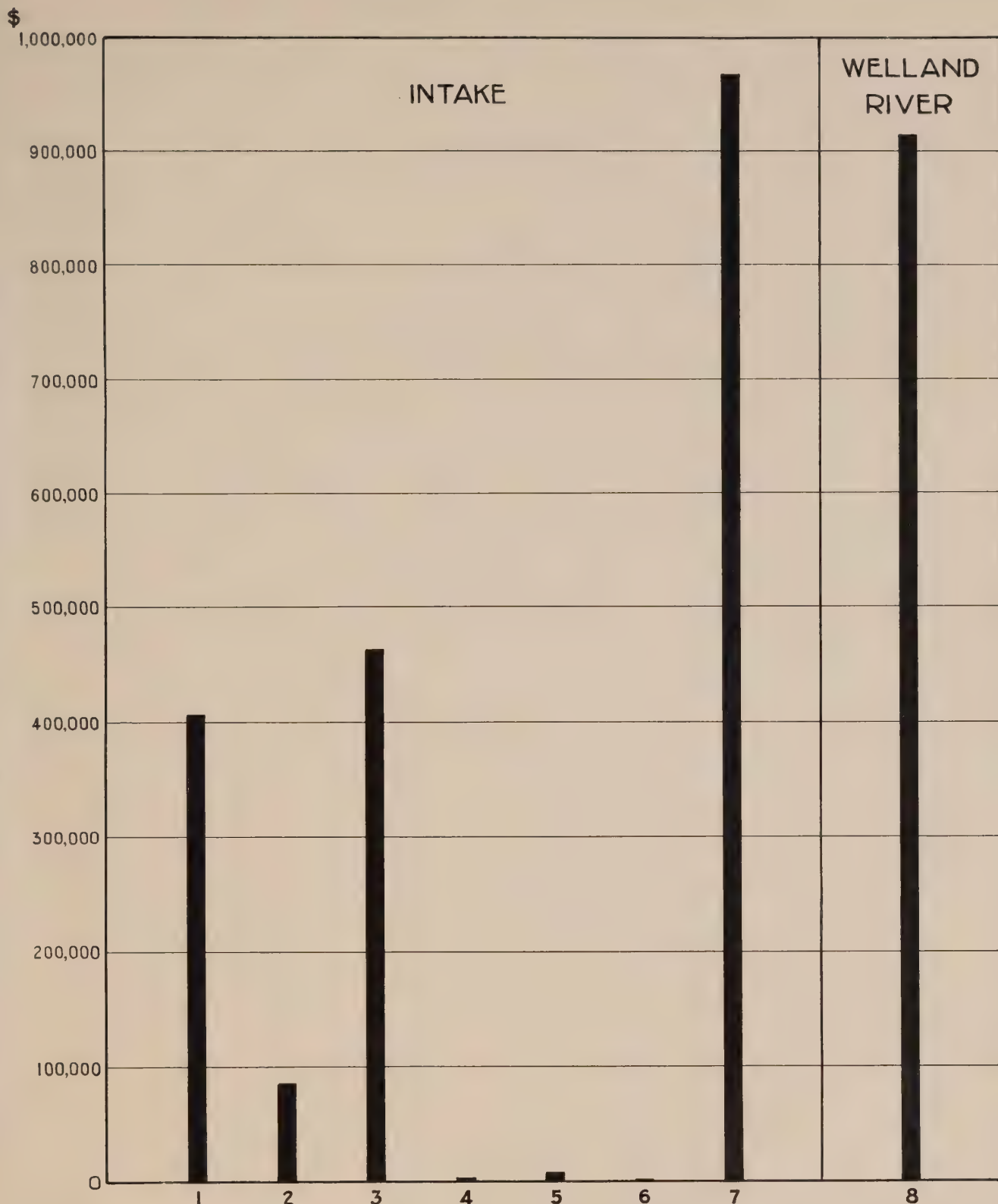


- |                            |                             |
|----------------------------|-----------------------------|
| 1 INTAKE                   | ✓ 9 RIGHT-OF-WAY            |
| ✓ 2 RIVER                  | 9A MISCELLANEOUS            |
| ✓ 3 CANAL                  | 10 QUEENSTON-POWER HOUSE RY |
| 4 FOREBAY                  | ✓ 11 PLANT SALVAGE          |
| 5 SCREEN HOUSE             | 12 STORES                   |
| ✓ 6 PENSTOCKS              | 13 EXPENDITURES, SALVAGING  |
| ✓ 7 POWER HOUSE            | 14 SALES AND WORK ORDERS    |
| ✓ 7A HYDRAULIC MACHINERY   | 15 SUSPENSE ACCOUNT         |
| ✓ 7B ELECTRICAL GENERATION | 16 BOND INTEREST            |
| ✓ 8 BRIDGES                | 17 GROSS TOTAL COST         |

**HYDRO-ELECTRIC INQUIRY COMMISSION**  
W.D.GREGORY, CHAIRMAN  
**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
**COST BY CONSTRUCTION ELEMENTS**  
**TOTAL EXPENDITURE ON PROJECT**  
**TO MARCH 31<sup>ST</sup> 1922**  
Toronto, May 2<sup>nd</sup>, 1923, Made by *W.D.G.* Checked by *L.H.*  
**WALTER J. FRANCIS & COMPANY**  
CONSULTING ENGINEERS





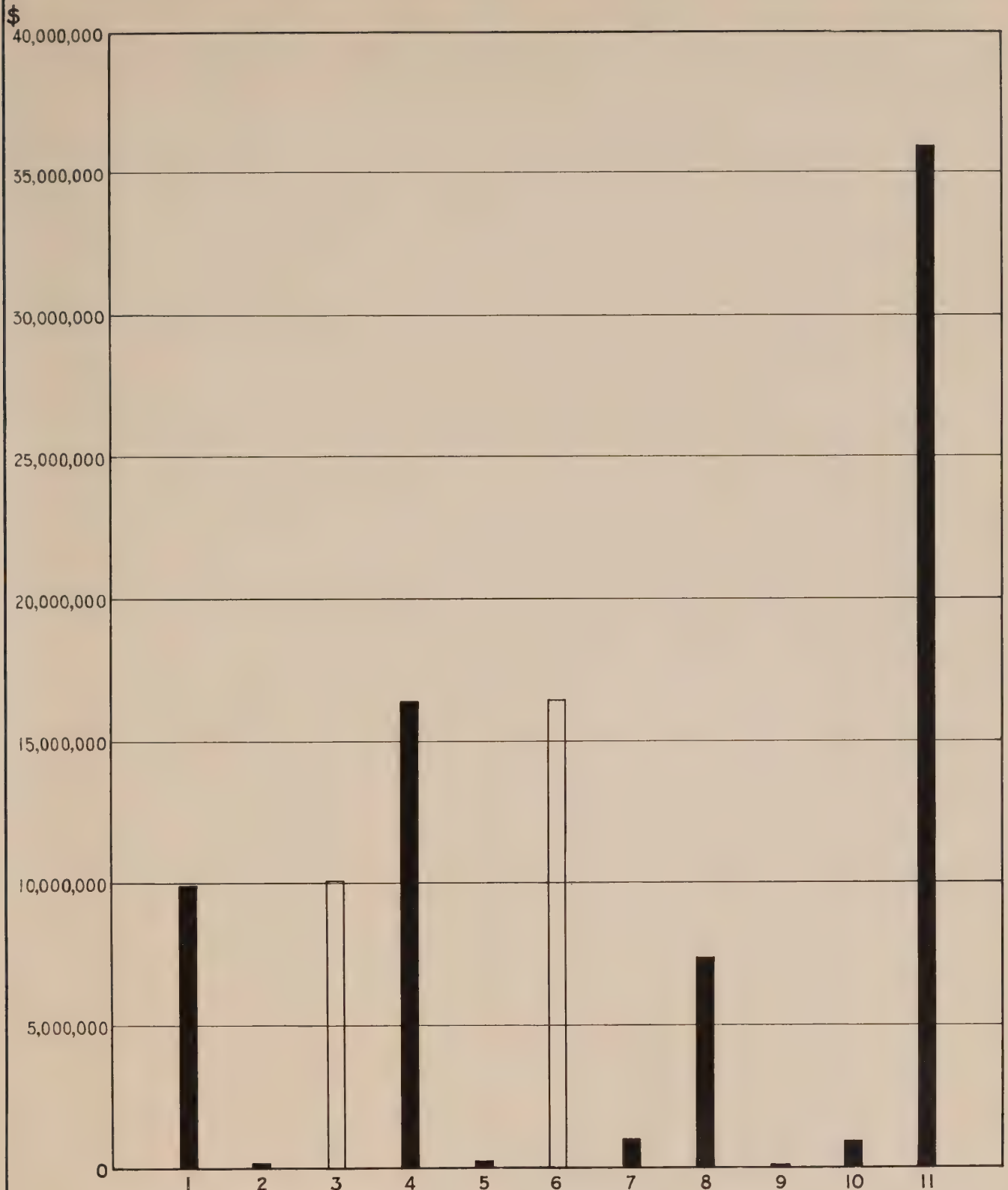


1	INTAKE	SHEET PILING	.....	\$	407,928.23
2	"	EARTH IN TEMPORARY DAM	.....		86,679.39
3	"	EARTH EXCAVATION	.....		463,499.20
4	"	ROCK	.....		1,375.11
5	"	CONCRETE	.....		5,608.88
6	"	REINFORCED CONCRETE	.....		458.20
7	"	TOTAL	.....	\$	<u>965,549.01</u>
8	WELLAND RIVER	EARTH EXCAVATION	.....	\$	<u>913,907.78</u>

HYDRO-ELECTRIC INQUIRY COMMISSION  
W. D. GREGORY, CHAIRMAN  
QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
COST BY CONSTRUCTION ELEMENTS  
**EXPENDITURE ON**  
**INTAKE AND WELLAND RIVER**  
To MARCH 31<sup>ST</sup> 1922  
Toronto, May 2nd, 1923. Made by *SRM*, Checked by *L.H.*  
WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS







1	EARTH EXCAVATION, CANAL	\$ 9,981,459.59
2	" " , CONSTRUCTION RY.	174,876.36
3	TOTAL EARTH EXCAVATION	\$ 10,156,335.95
4	ROCK EXCAVATION, CANAL	16,274,868.88
5	" " , CONSTRUCTION RY.	189,480.06
6	TOTAL ROCK EXCAVATION	\$ 16,464,348.94
7	DREDGING	1,003,780.92
8	CONCRETE	7,300,871.55
9	STRUCTURAL STEEL, CONTROL GATE	61,289.55
10	RIE-RAP	951,073.71
11	TOTAL (CANAL)	\$ 35,937,700.62

# HYDRO-ELECTRIC INQUIRY COMMISSION

W. D. GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

### COST BY CONSTRUCTION ELEMENTS

## EXPENDITURE ON CANAL

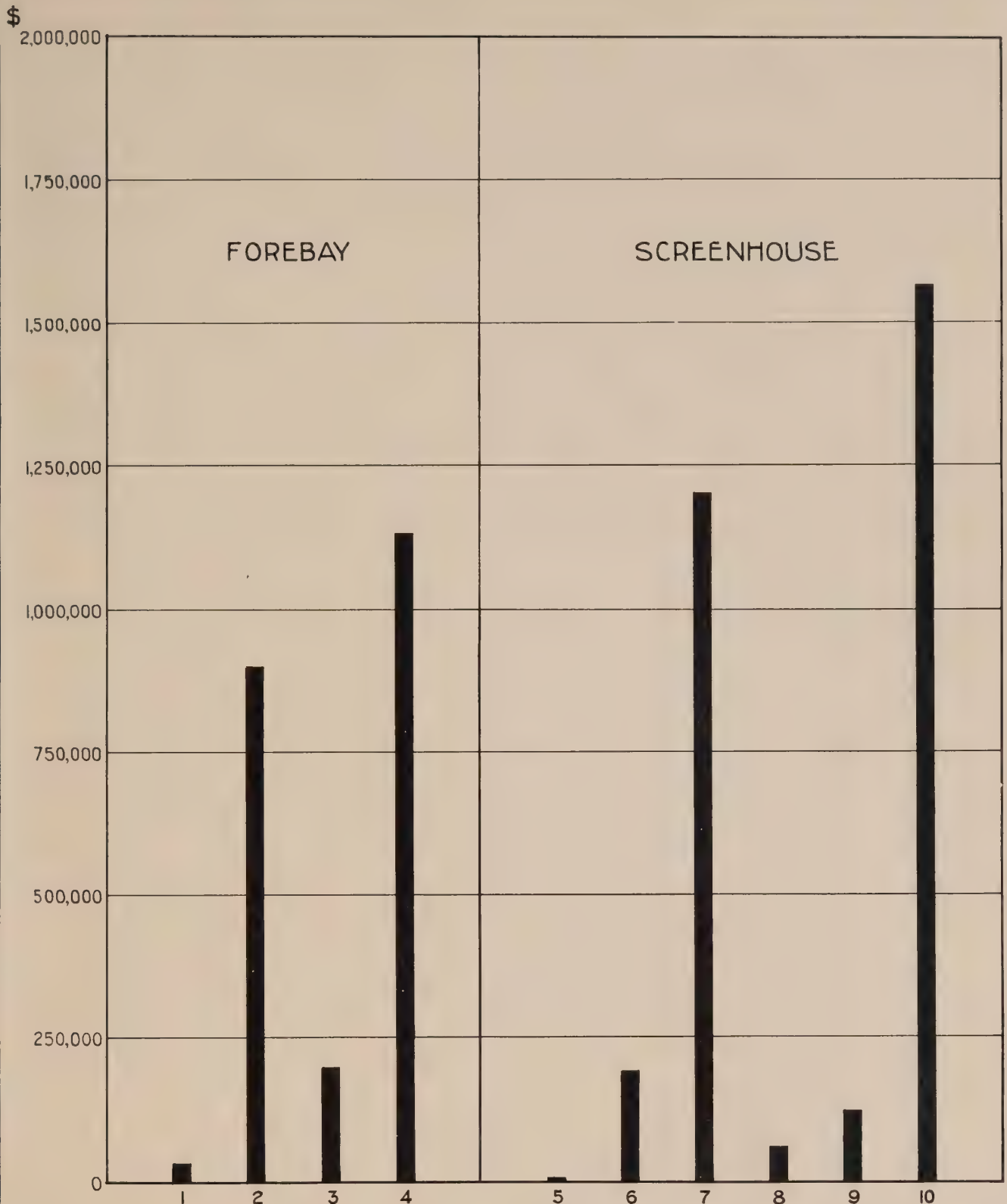
TO MARCH 31<sup>ST</sup> 1922

Toronto, May 2nd, 1923. Made by *SWH*, Checked by *LLH*.

WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS







1	FOREBAY,	EARTH EXCAVATION . . . . .	\$ 29,052.60
2	"	ROCK " . . . . .	901,705.40
3	"	CONCRETE . . . . .	202,721.03
4	"	TOTAL . . . . .	\$ 1,133,479.03
5	SCREEN HOUSE,	EARTH EXCAVATION . . . . .	2,245.88
6	"	ROCK " . . . . .	189,427.79
7	"	REINFORCED CONCRETE . . . . .	1,194,088.90
8	"	STRUCTURAL STEEL . . . . .	58,118.40
9	"	RACKS, GATES & ICE CHUTE . . . . .	119,840.64
10	"	TOTAL . . . . .	\$ 1,563,721.61

## HYDRO-ELECTRIC INQUIRY COMMISSION

W.D.GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

COST BY CONSTRUCTION ELEMENTS

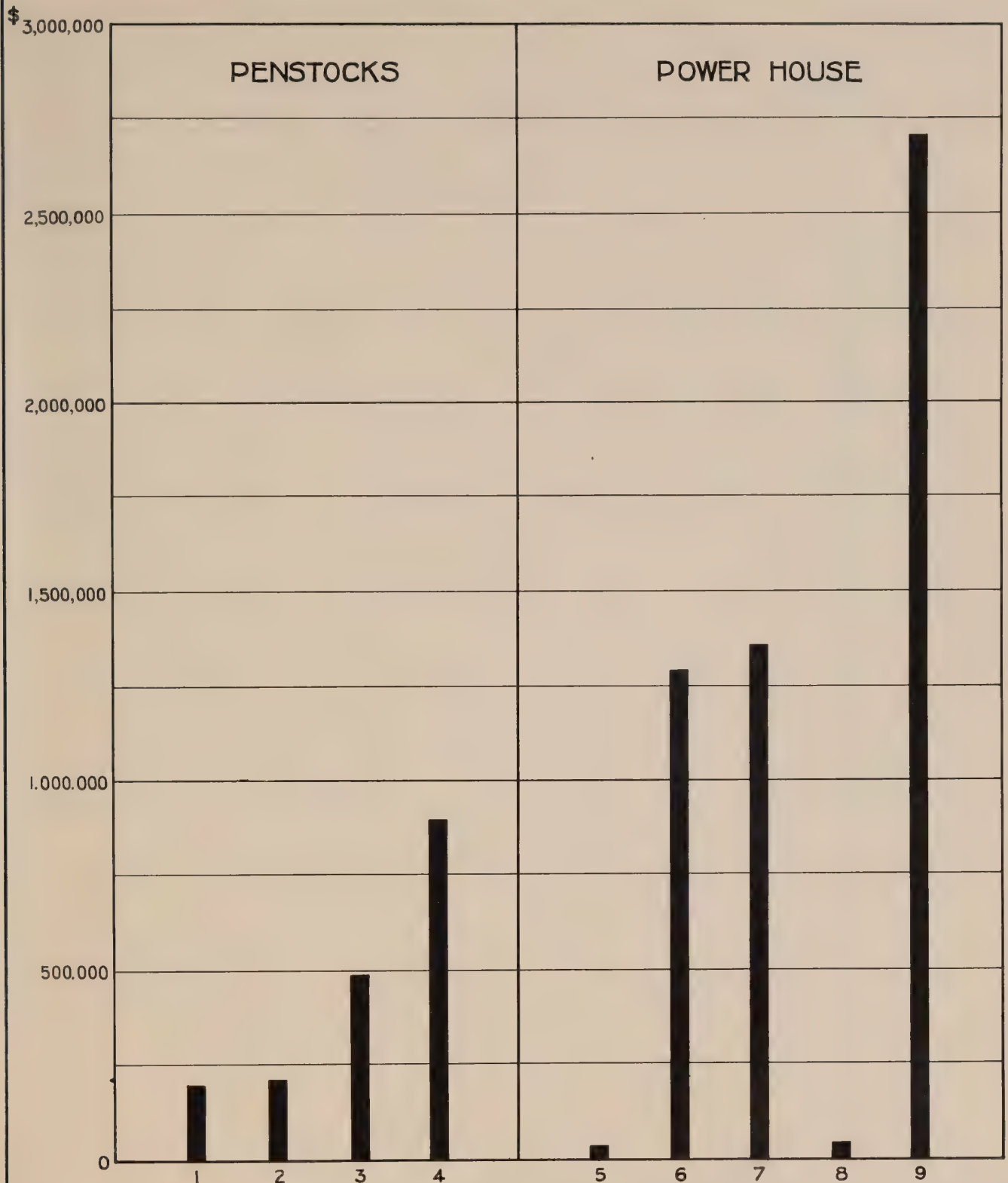
**EXPENDITURE ON  
FOREBAY & SCREENHOUSE**TO MARCH 31<sup>ST</sup> 1922Toronto, May 2nd, 1923, Made by *W.D.G.*, Checked by *W.J.F.*

WALTER J. FRANCIS &amp; COMPANY

CONSULTING ENGINEERS





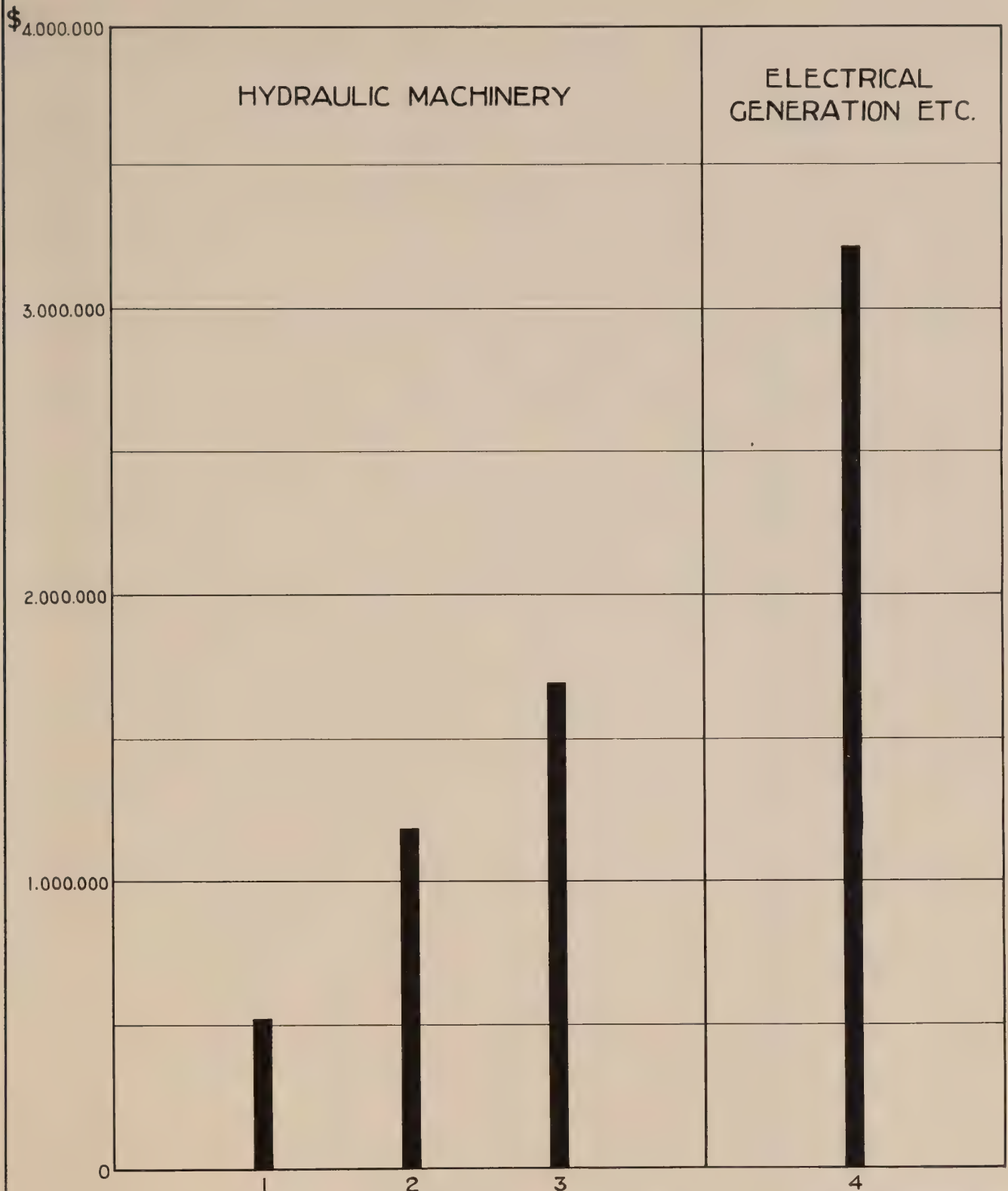


1	PENSTOCKS, ROCK EXCAVATION	.....	\$	199,198.74
2	" CONCRETE	.....		212,305.16
3	" STEEL WORK	.....		483,702.00
4	" TOTAL	.....	\$	<u>895,205.90</u>
5	POWER HOUSE, EARTH EXCAVATION	.....		25,441.89
6	" " ROCK	.....		1,282,806.18
7	" " CONCRETE	.....		1,358,068.96
8	" " STRUCTURAL STEEL	.....		37,681.90
9	" " TOTAL	.....	\$	<u>2,703,998.93</u>

HYDRO-ELECTRIC INQUIRY COMMISSION  
W. D. GREGORY, CHAIRMAN  
QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
COST BY CONSTRUCTION ELEMENTS  
**EXPENDITURE ON**  
**PENSTOCKS, POWER HOUSE & TAILRACE**  
To MARCH 31<sup>ST</sup> 1922  
Toronto, May 2<sup>ND</sup>, 1923, Made by *SRW*, Checked by *L.H.*  
WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS





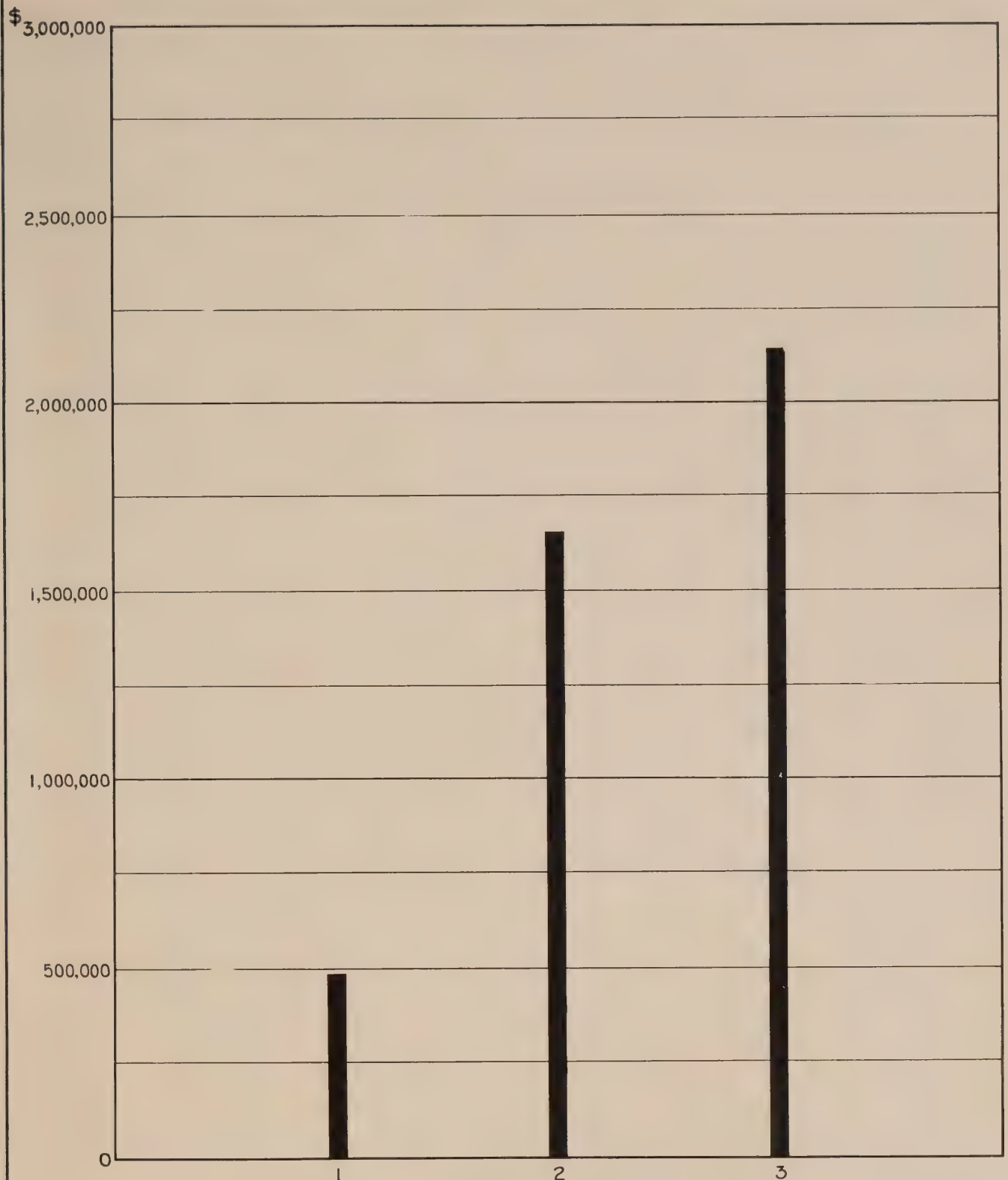


HYDRAULIC MACHINERY		\$
1	JOHNSON VALVES . . . . .	520,393.08
2	TURBINE AND GENERAL EQUIPMENT . . . . .	1,176,715.23
3	TOTAL . . . . .	<u>\$1,697,108.31</u>
4	ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE	<u>\$3,214,413.15</u>

**HYDRO-ELECTRIC INQUIRY COMMISSION**  
 W.D.GREGORY, CHAIRMAN  
**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
**COST BY CONSTRUCTION ELEMENTS**  
**HYDRAULIC MACHINERY**  
**ELECTRICAL GENERATION**  
**AND PROPORTION OF SUPERSTRUCTURE**  
**TO MARCH 31ST 1922**  
 Toronto, May 2nd., 1923. Made by *W.J.F.* Checked by *L.H.*  
**WALTER J. FRANCIS & COMPANY**  
 CONSULTING ENGINEERS



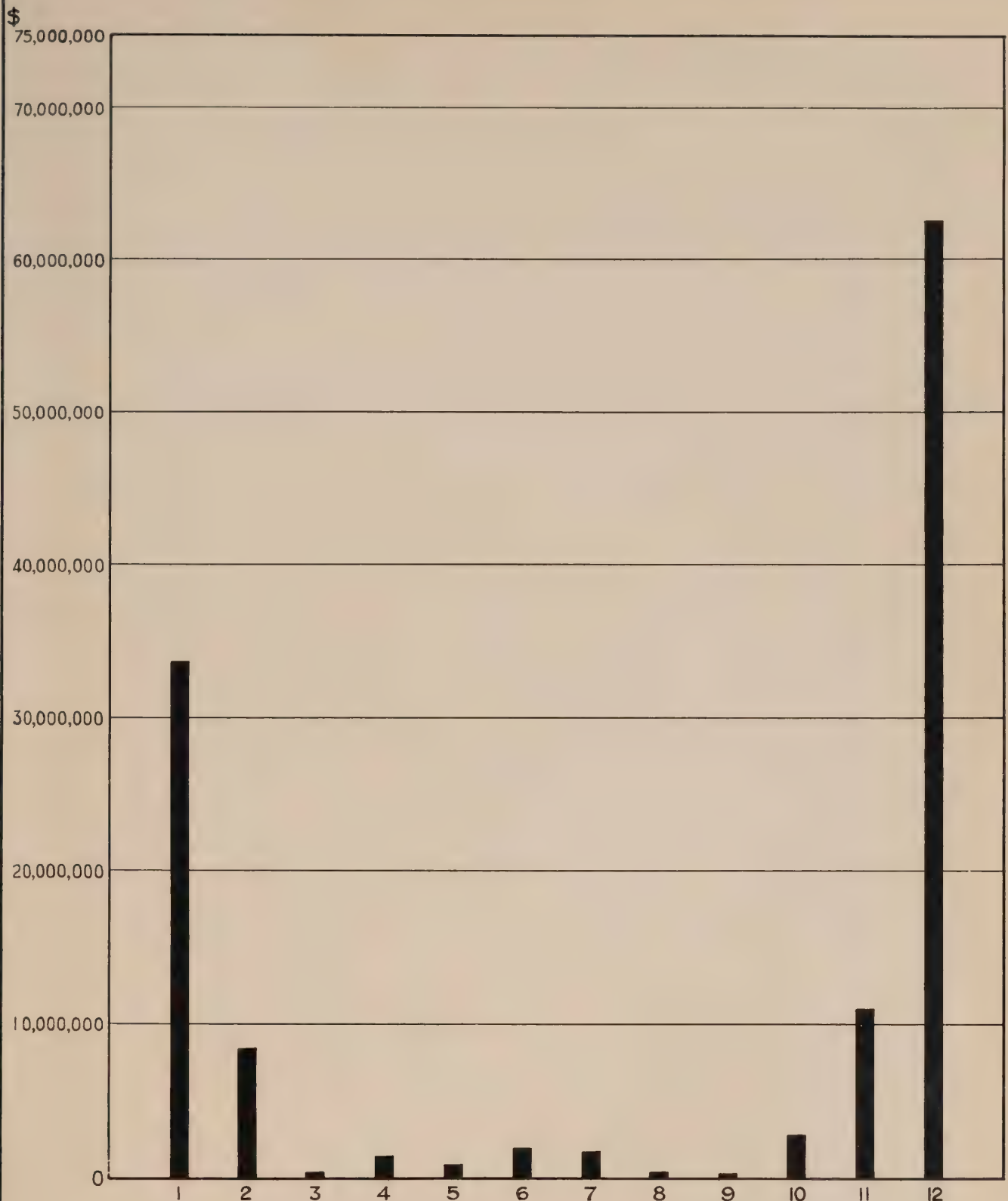




1	TEMPORARY BRIDGES	.....	\$	485,486.03
2	PERMANENT BRIDGES	.....	\$	1,652,771.89
3	TOTAL	.....	\$	<u>2,138,257.92</u>

**HYDRO-ELECTRIC INQUIRY COMMISSION**  
 W.D.GREGORY, CHAIRMAN  
**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
 COST BY CONSTRUCTION ELEMENTS  
**EXPENDITURE ON BRIDGES**  
 To MARCH 31<sup>ST</sup> 1922  
 Toronto, May 2<sup>nd</sup>, 1923, Made by *SRW*, Checked by *WJF*  
**WALTER J. FRANCIS & COMPANY**  
 CONSULTING ENGINEERS





1	DIRECT COSTS .....	\$ 33,728,917.06
2	FIELD SERVICE COSTS .....	8,315,119.49
3	FIELD OVERHEAD COSTS .....	245,086.69
4	CONSTRUCTION INTEREST .....	1,427,279.18
5	ADMINISTRATIVE FIELD OVERHEAD COSTS ..	765,075.50
6	HEAD OFFICE OVERHEAD COSTS .....	1,855,047.73
7	UNWATERING .....	1,744,806.46
8	CONTINGENCIES .....	214,506.00
9	HOSPITAL AND MEDICAL SERVICES .....	160,537.56
10	MAIN LINE RAILWAYS AND ROADS .....	2,831,937.69
11	MISCELLANEOUS ITEMS .....	11,087,285.99
12	TOTAL .....	<u>\$ 62,375,599.35</u>

# HYDRO-ELECTRIC INQUIRY COMMISSION

W. D. GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

COST BY CLASSIFICATION

## TOTAL EXPENDITURE ON PROJECT

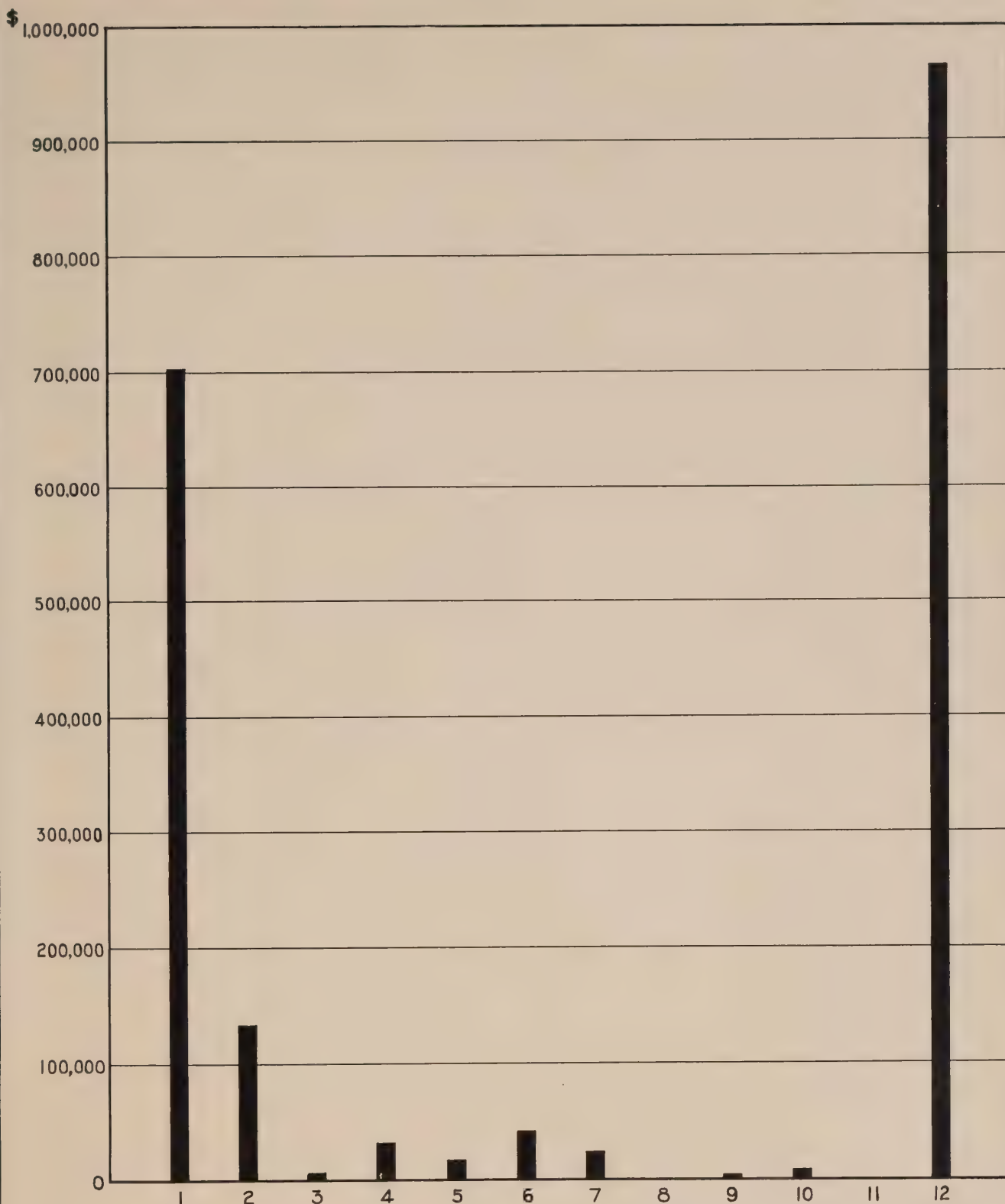
To MARCH 31<sup>ST</sup> 1922

Toronto, May 2nd., 1923, Made by *SRW*, Checked by *L.H.*

WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS







1	DIRECT COSTS . . . . .	\$ 702,578.70
2	FIELD SERVICE COSTS . . . . .	132,244.10
3	FIELD OVERHEAD COSTS . . . . .	5,949.19
4	CONSTRUCTION INTEREST . . . . .	31,325.90
5	ADMINISTRATIVE FIELD OVERHEAD COSTS . . . . .	18,617.37
6	HEAD OFFICE OVERHEAD COSTS . . . . .	41,115.99
7	UNWATERING . . . . .	24,148.18
8	CONTINGENCIES . . . . .	0.00
9	HOSPITAL AND MEDICAL SERVICES . . . . .	2,366.00
10	MAIN LINE RAILWAYS AND ROADS . . . . .	7,203.58
11	MISCELLANEOUS ITEMS . . . . .	0.00
12	TOTAL . . . . .	\$ 965,549.01

# HYDRO-ELECTRIC INQUIRY COMMISSION

W. D. GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

COST BY CLASSIFICATION

## EXPENDITURE ON INTAKE

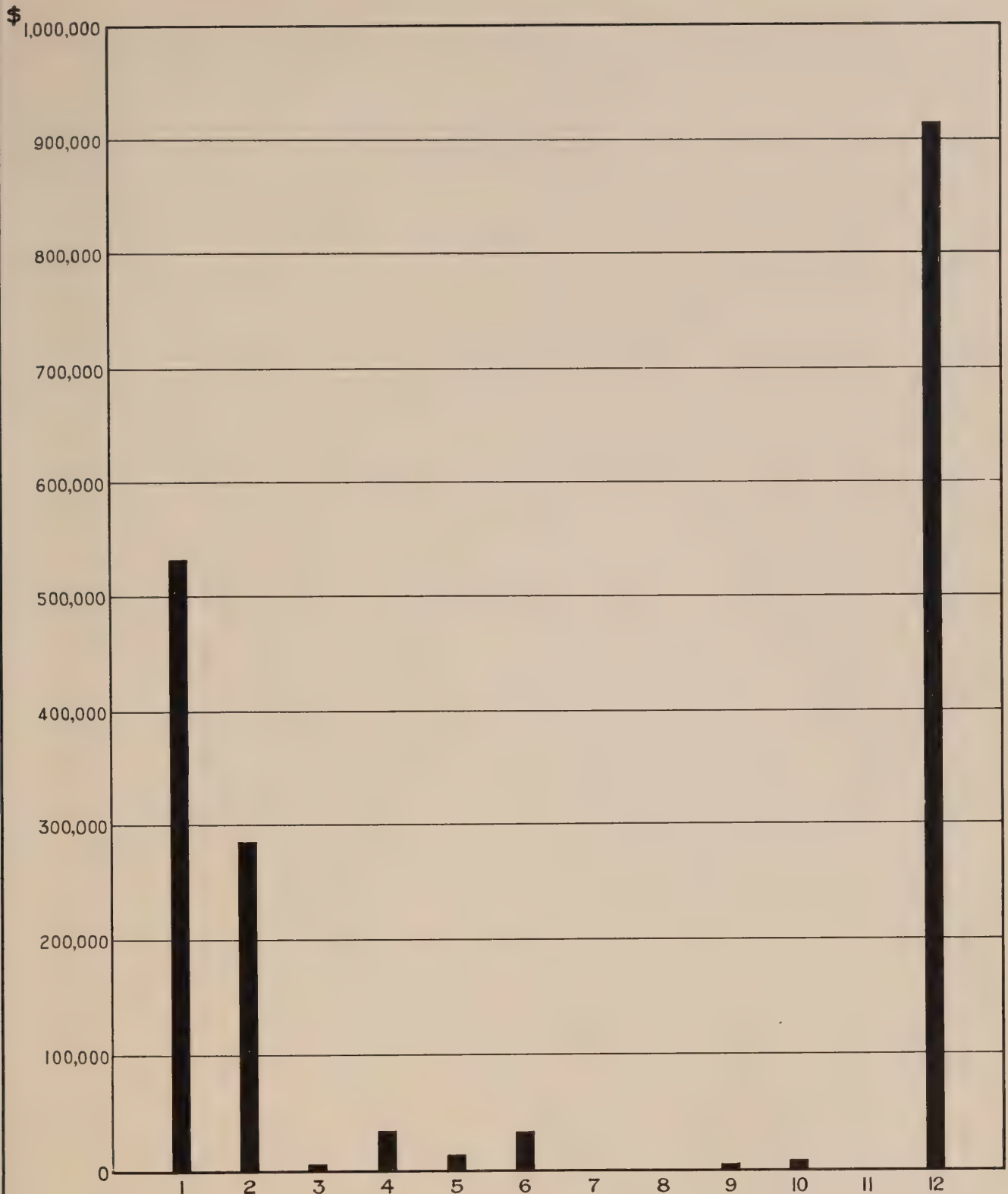
TO MARCH 31<sup>ST</sup> 1922

Toronto, May 2nd, 1923, Made by *SRW*, Checked by *WJF*

WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS



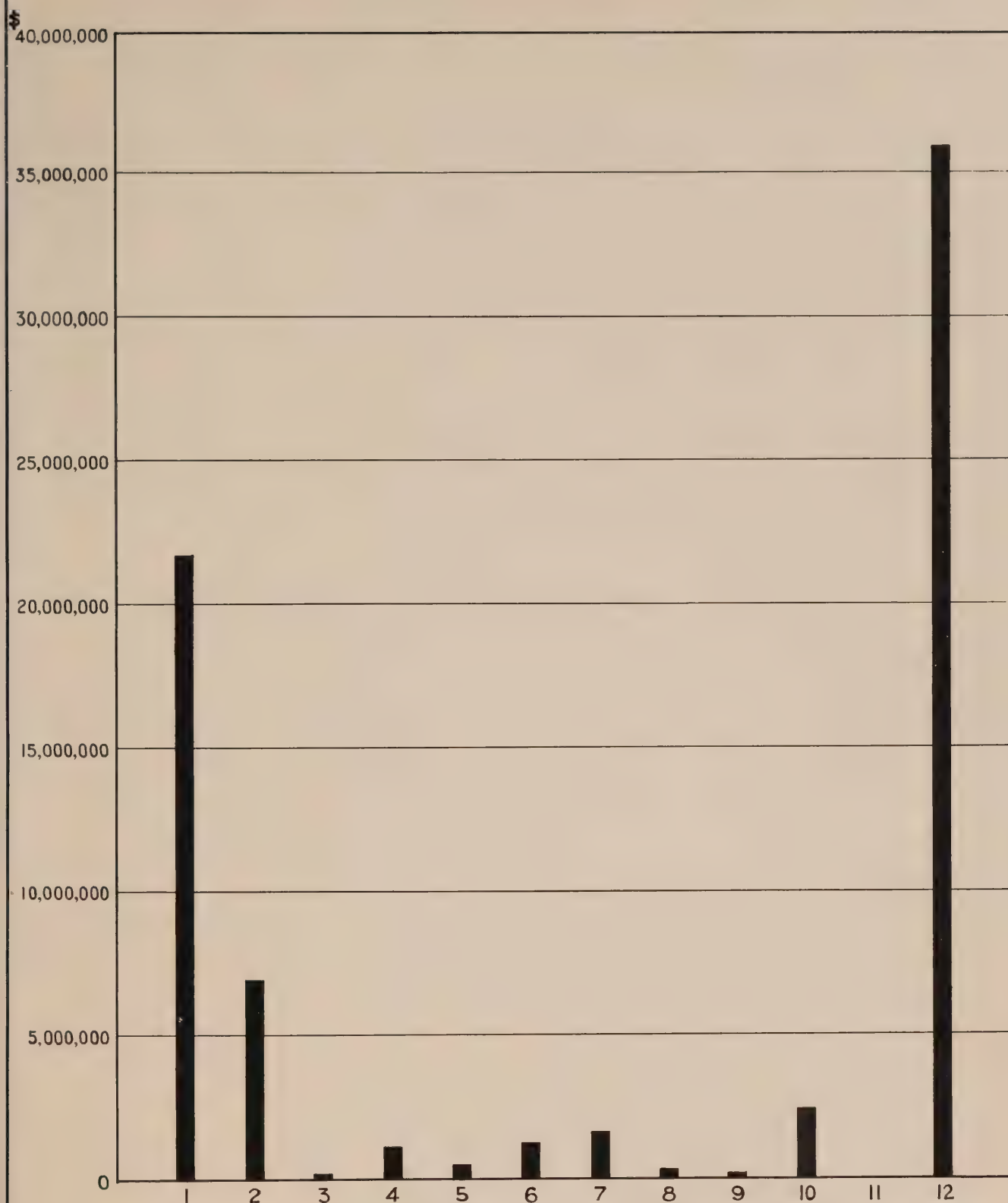




1	DIRECT COSTS	531,633.34
2	FIELD SERVICE COSTS	285,930.50
3	FIELD OVERHEAD COSTS	4,320.00
4	CONSTRUCTION INTEREST	35,411.90
5	ADMINISTRATIVE FIELD OVERHEAD COSTS	13,638.13
6	HEAD OFFICE OVERHEAD COSTS	32,095.65
7	UNWATERING	0.00
8	CONTINGENCIES	0.00
9	HOSPITAL AND MEDICAL SERVICES	3,030.00
10	MAIN LINE RAILWAYS AND ROADS	7,848.26
11	MISCELLANEOUS ITEMS	0.00
12	TOTAL	913,907.78

HYDRO-ELECTRIC INQUIRY COMMISSION  
 W.D.GREGORY, CHAIRMAN  
 QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
 COST BY CLASSIFICATION  
**EXPENDITURE ON RIVER**  
 To MARCH 31<sup>ST</sup> 1922  
 Toronto, May 2nd., 1923, Made by *SRW*, Checked by *L.H.*  
 WALTER J. FRANCIS & COMPANY  
 CONSULTING ENGINEERS





1	DIRECT COSTS .....	\$ 21,714,994.72
2	FIELD SERVICE COSTS .....	6,896,736.22
3	FIELD OVERHEAD COSTS .....	150,052.94
4	CONSTRUCTION INTEREST .....	1,055,546.69
5	ADMINISTRATIVE FIELD OVERHEAD COSTS ..	468,405.76
6	HEAD OFFICE OVERHEAD COSTS .....	1,203,746.27
7	UNWATERING .....	1,645,187.96
8	CONTINGENCIES .....	214,506.00
9	HOSPITAL AND MEDICAL SERVICES .....	134,130.00
10	MAIN LINE RAILWAYS AND ROADS .....	2,454,394.06
11	MISCELLANEOUS ITEMS .....	0.00
12	TOTAL .....	<u>\$ 35,937,700.62</u>

# HYDRO-ELECTRIC INQUIRY COMMISSION

W.D.GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

### COST BY CLASSIFICATION

## EXPENDITURE ON CANAL

TO MARCH 31<sup>ST</sup> 1922

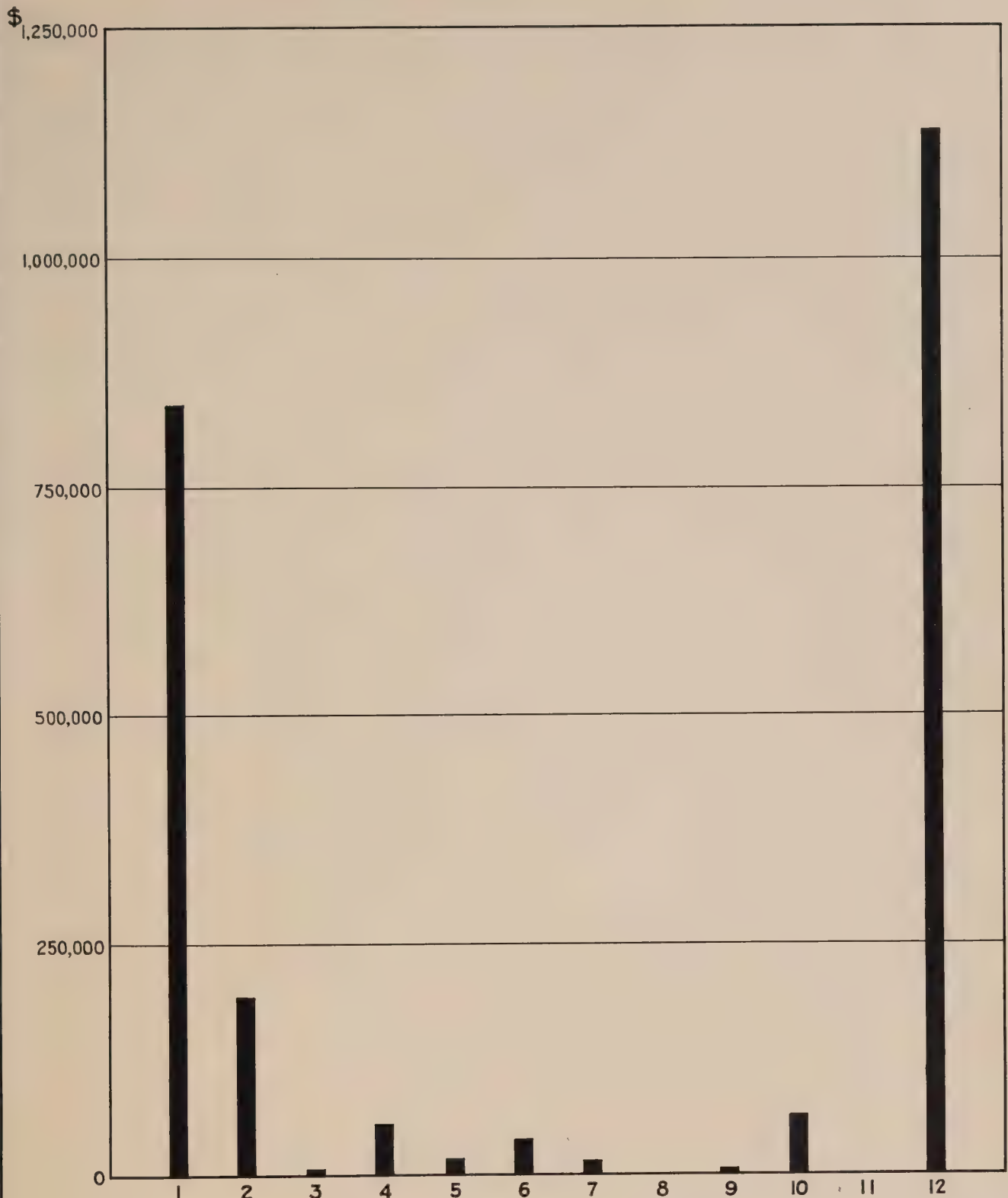
Toronto, May 2nd., 1923, Made by *W.D.G.* Checked by *W.J.F.*

WALTER J. FRANCIS & COMPANY

CONSULTING ENGINEERS





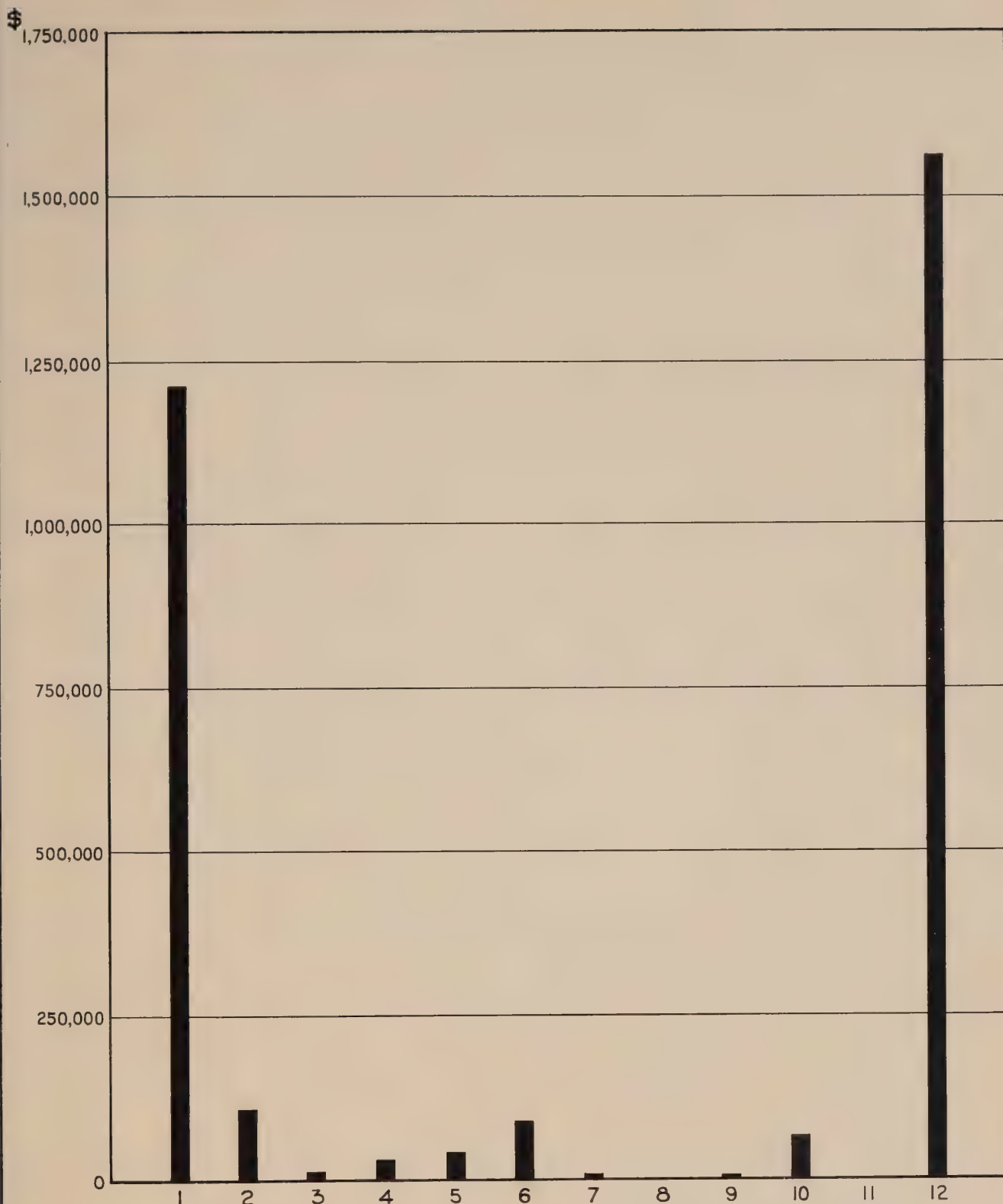


1	DIRECT COSTS .....	\$ 757,983.15
2	FIELD SERVICE COSTS .....	184,841.49
3	FIELD OVERHEAD COSTS .....	5,099.20
4	CONSTRUCTION INTEREST .....	54,479.83
5	ADMINISTRATIVE FIELD OVERHEAD COSTS .....	15,920.64
6	HEAD OFFICE OVERHEAD COSTS .....	37,105.21
7	UNWATERING .....	13,100.00
8	CONTINGENCIES .....	0.00
9	HOSPITAL AND MEDICAL SERVICES .....	2,724.00
10	MAIN LINE RAILWAYS AND ROADS .....	62,225.51
11	MISCELLANEOUS ITEMS .....	0.00
12	TOTAL .....	\$ 1,133,479.03

HYDRO-ELECTRIC INQUIRY COMMISSION  
W.D.GREGORY, CHAIRMAN  
QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
COST BY CLASSIFICATION  
**EXPENDITURE ON FOREBAY**  
To MARCH 31<sup>ST</sup> 1922  
Toronto, May 2<sup>ND</sup>, 1923, Made by *W.J.F.*, Checked by *L.H.*  
WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS



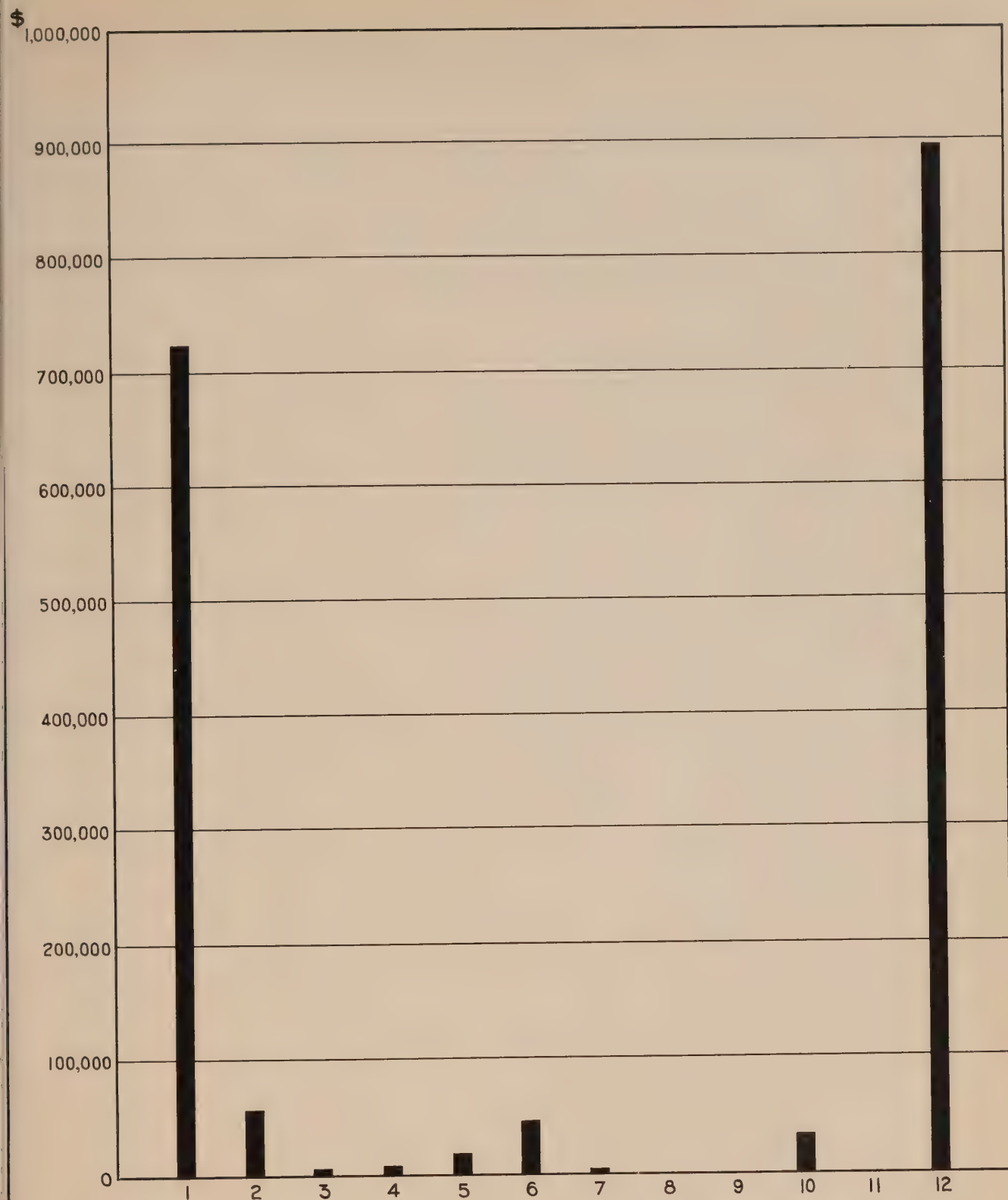




1	DIRECT COSTS	1,212,198.74
2	FIELD SERVICE COSTS	109,285.16
3	FIELD OVERHEAD COSTS	13,308.96
4	CONSTRUCTION INTEREST	28,601.91
5	ADMINISTRATIVE FIELD OVERHEAD COSTS	41,528.71
6	HEAD OFFICE OVERHEAD COSTS	87,985.18
7	UNWATERING	5,173.00
8	CONTINGENCIES	0.00
9	HOSPITAL AND MEDICAL SERVICES	2,994.00
10	MAIN LINE RAILWAYS AND ROADS	62,645.95
11	MISCELLANEOUS ITEMS	0.00
12	TOTAL	<u>1,563,721.61</u>

HYDRO-ELECTRIC INQUIRY COMMISSION  
 W.D.GREGORY, CHAIRMAN  
 QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
 COST BY CLASSIFICATION  
**EXPENDITURE ON SCREENHOUSE**  
 To MARCH 31<sup>ST</sup> 1922  
 Toronto, May 2nd., 1923, Made by *W.J.F.*, Checked by *L.H.*  
 WALTER J. FRANCIS & COMPANY  
 CONSULTING ENGINEERS



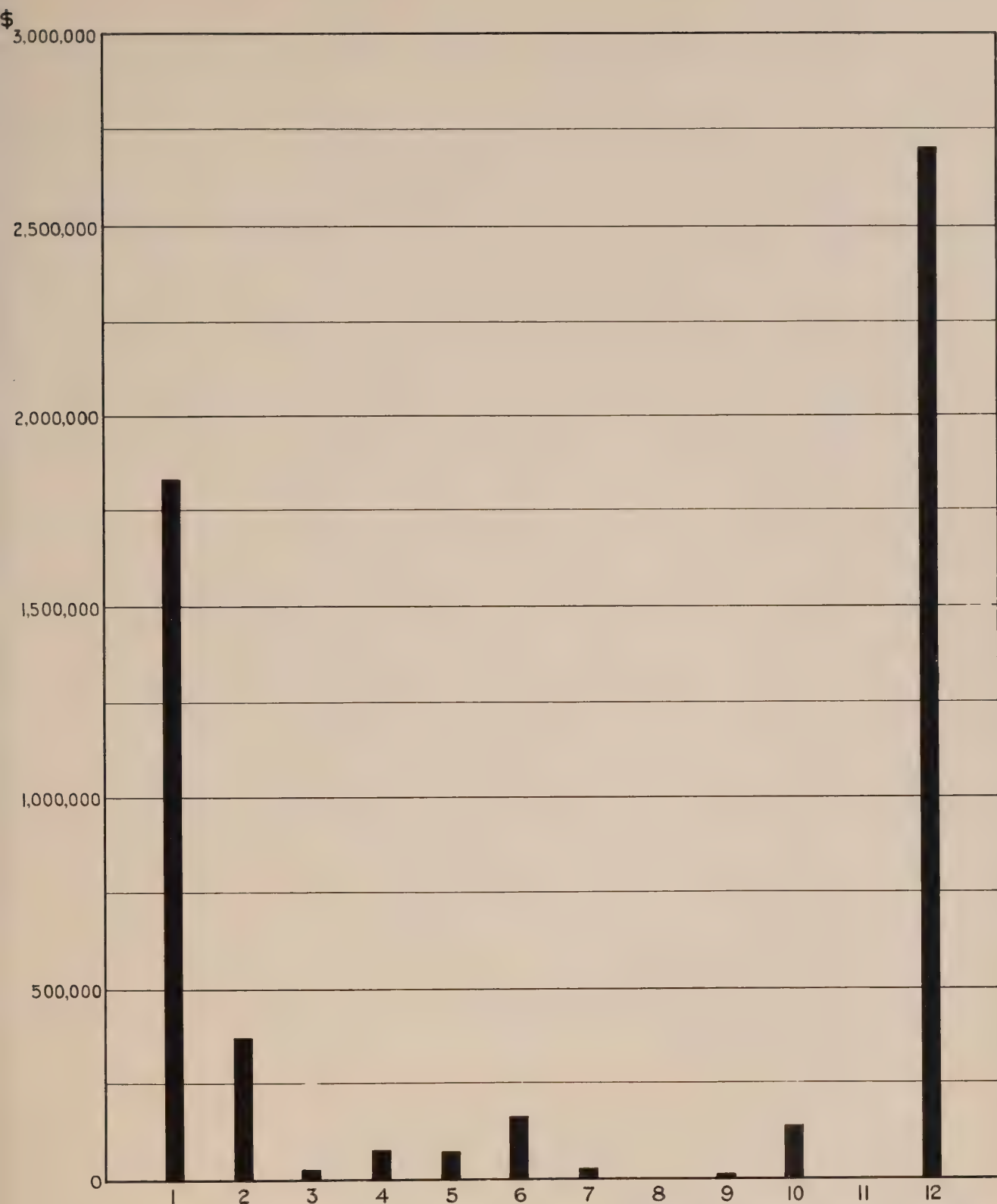


1	DIRECT COSTS	\$724,196.28
2	FIELD SERVICE COSTS	56,844.81
3	FIELD OVERHEAD COSTS	5,824.46
4	CONSTRUCTION INTEREST	6,809.98
5	ADMINISTRATIVE FIELD OVERHEAD COSTS	18,306.93
6	HEAD OFFICE OVERHEAD COSTS	46,148.08
7	UNWATERING	2,756.61
8	CONTINGENCIES	0.00
9	HOSPITAL AND MEDICAL SERVICES	1,300.00
10	MAIN LINE RAILWAYS AND ROADS	33,018.75
11	MISCELLANEOUS ITEMS	0.00
12	TOTAL	\$895,205.90

HYDRO-ELECTRIC INQUIRY COMMISSION  
 W.D.GREGORY, CHAIRMAN  
 QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
 COST BY CLASSIFICATION  
**EXPENDITURE ON PENSTOCKS**  
 TO MARCH 31<sup>ST</sup> 1922  
 Toronto, May 2nd, 1923. Made by *W.F.*, Checked by *L.H.*  
 WALTER J. FRANCIS & COMPANY  
 CONSULTING ENGINEERS



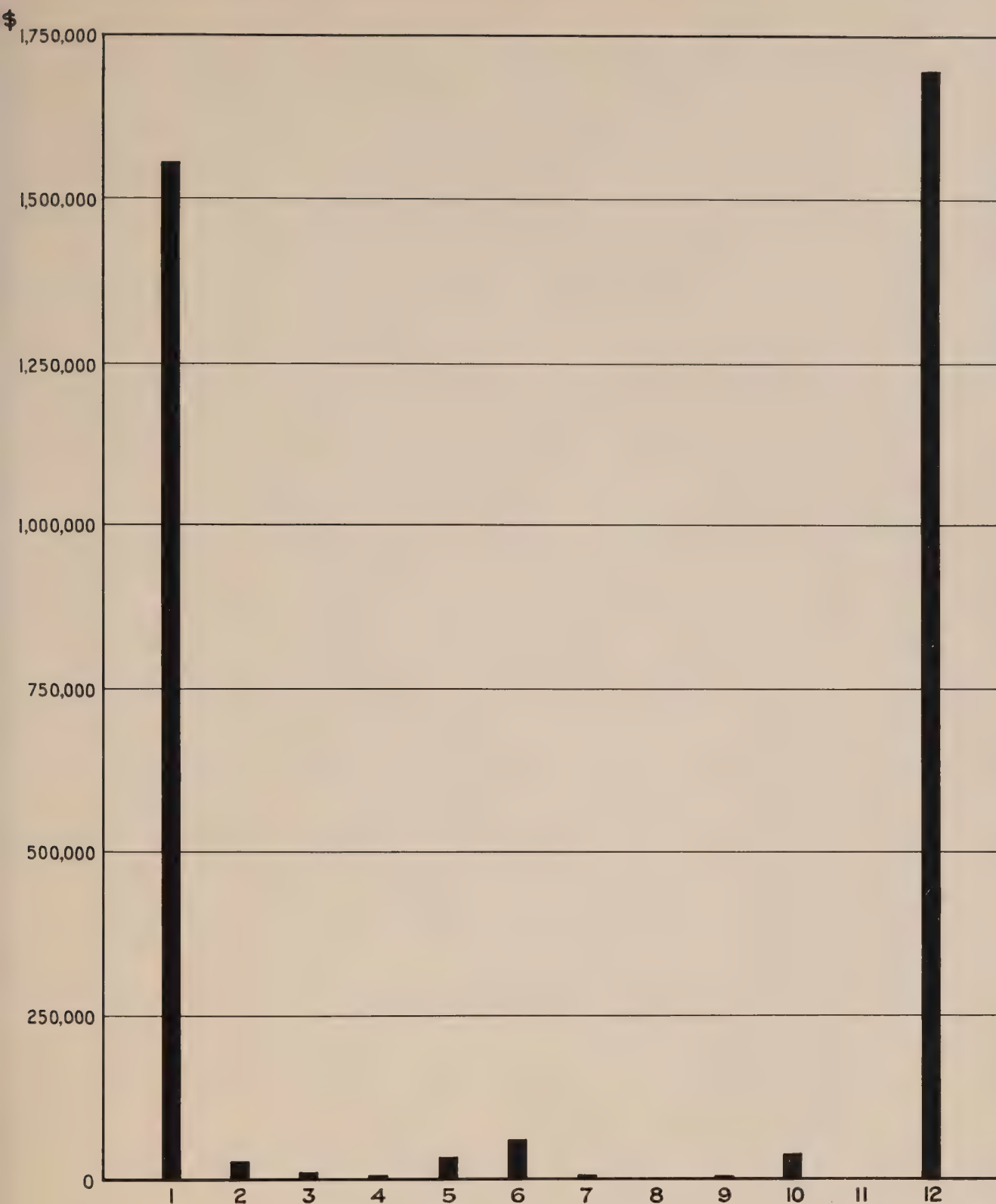




1	DIRECT COSTS	1,835,790.28
2	FIELD SERVICE COSTS	375,520.57
3	FIELD OVERHEAD COSTS	22,697.08
4	CONSTRUCTION INTEREST	72,185.77
5	ADMINISTRATIVE FIELD OVERHEAD COSTS	70,865.32
6	HEAD OFFICE OVERHEAD COSTS	161,674.15
7	UNWATERING	23,525.00
8	CONTINGENCIES	0.00
9	HOSPITAL AND MEDICAL SERVICES	8,040.00
10	MAIN LINE RAILWAYS AND ROADS	133,700.76
11	MISCELLANEOUS ITEMS	0.00
12	TOTAL	2,703,998.93

**HYDRO-ELECTRIC INQUIRY COMMISSION**  
 W.D.GREGORY, CHAIRMAN  
**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
**COST BY CLASSIFICATION**  
**EXPENDITURE ON**  
**POWER HOUSE AND TAILRACE**  
**TO MARCH 31<sup>ST</sup> 1922**  
 Toronto, May 2nd., 1923, Made by *WJF*, Checked by *WJF*  
**WALTER J. FRANCIS & COMPANY**  
 CONSULTING ENGINEERS



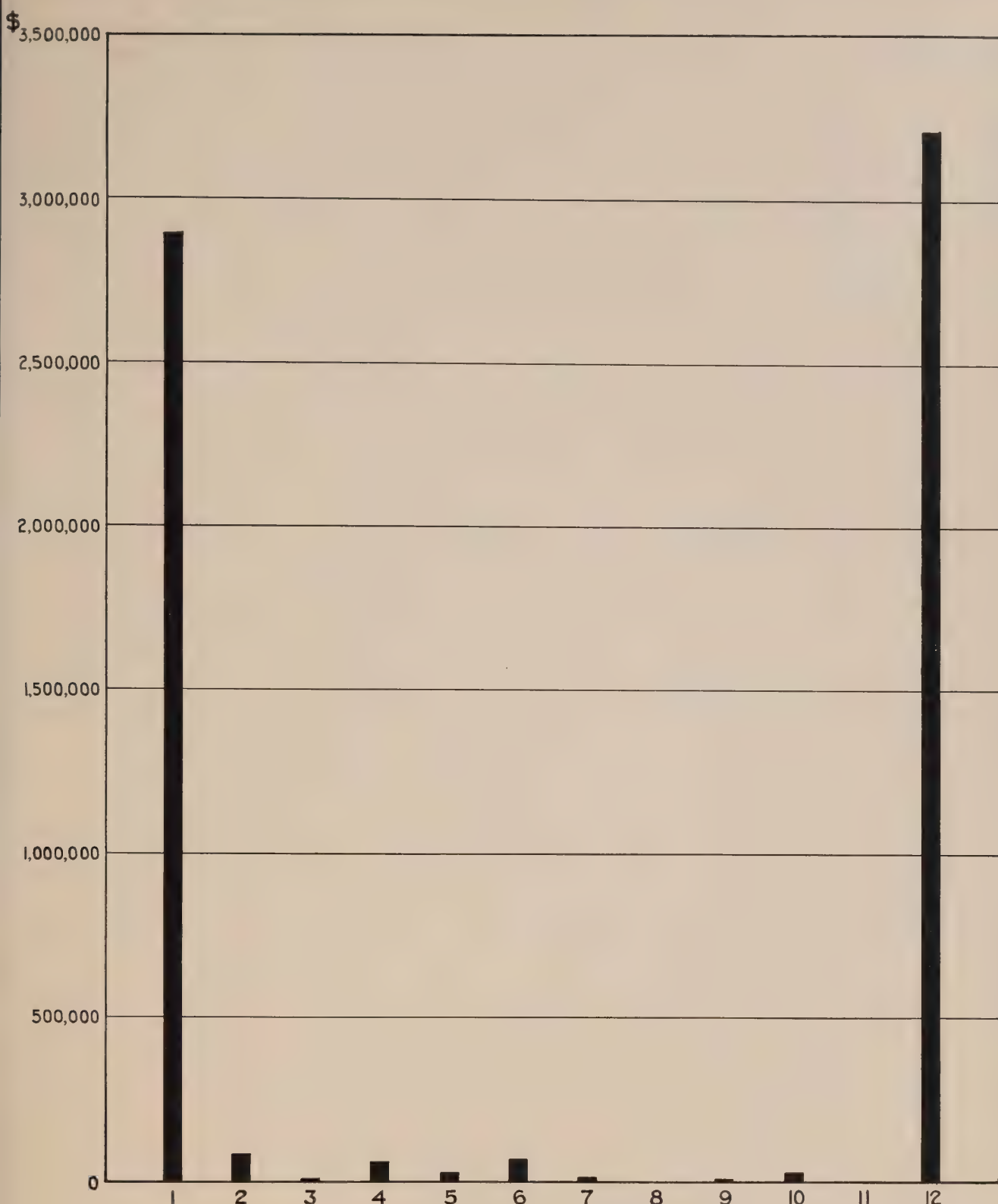


1	DIRECT COSTS . . . . .	\$ 1,557,608.06
2	FIELD SERVICE COSTS . . . . .	26,815.28
3	FIELD OVERHEAD COSTS . . . . .	10,369.70
4	CONSTRUCTION INTEREST . . . . .	2,723.99
5	ADMINISTRATIVE FIELD OVERHEAD COSTS . . . . .	31,864.70
6	HEAD OFFICE OVERHEAD COSTS . . . . .	60,846.60
7	UNWATERING . . . . .	2,071.00
8	CONTINGENCIES . . . . .	0.00
9	HOSPITAL AND MEDICAL SERVICES . . . . .	1,025.00
10	MAIN LINE RAILWAYS AND ROADS . . . . .	3,783.98
11	MISCELLANEOUS ITEMS . . . . .	0.00
12	TOTAL . . . . .	<u>\$ 1,697,108.31</u>

HYDRO-ELECTRIC INQUIRY COMMISSION  
W.D.GREGORY, CHAIRMAN  
QUEENSTON-CHIPPAWA POWER DEVELOPMENT  
COST BY CLASSIFICATION  
EXPENDITURE ON  
HYDRAULIC MACHINERY  
TO MARCH 31<sup>ST</sup> 1922  
Toronto, May 2nd, 1923, Made by *E.H.D.* Checked by *J.H.H.*  
WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS



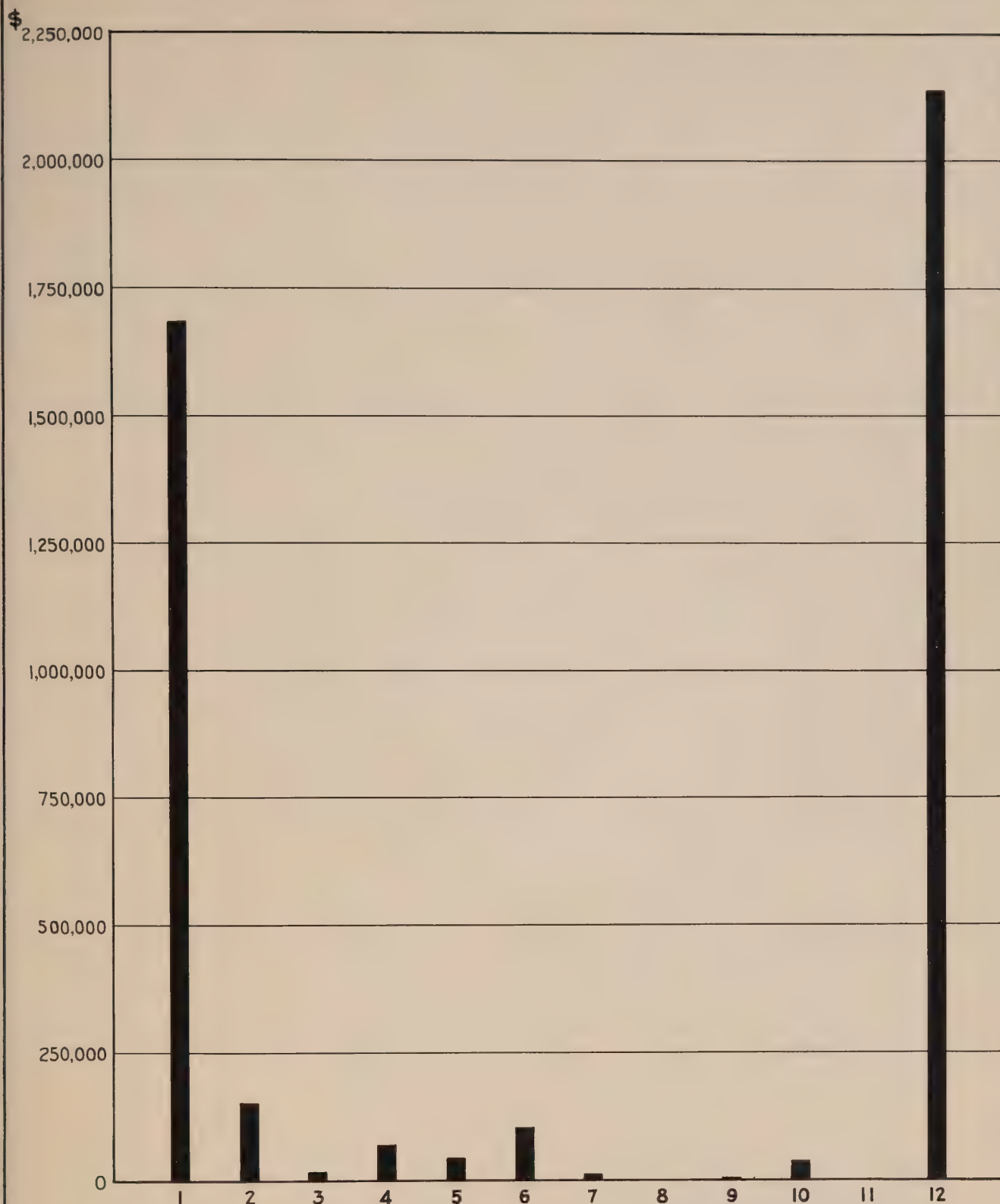




1	DIRECT COSTS	\$ 2,898,464.78
2	FIELD SERVICE COSTS	84,721.36
3	FIELD OVERHEAD COSTS	10,489.40
4	CONSTRUCTION INTEREST	65,283.45
5	ADMINISTRATIVE FIELD OVERHEAD COSTS	32,893.60
6	HEAD OFFICE OVERHEAD COSTS	73,652.00
7	UNWATERING	18,307.30
8	CONTINGENCIES	0.00
9	HOSPITAL AND MEDICAL SERVICES	1,603.56
10	MAIN LINE RAILWAYS AND ROADS	28,997.70
11	MISCELLANEOUS ITEMS	0.00
12	TOTAL	\$ 3,214,413.15

**HYDRO-ELECTRIC INQUIRY COMMISSION**  
 W.D.GREGORY, CHAIRMAN  
**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
 COST BY CLASSIFICATION  
**EXPENDITURE ON ELECTRICAL GENERATION,  
 AND PROPORTION OF SUPERSTRUCTURE**  
 TO MARCH 31<sup>ST</sup> 1922  
 Toronto, May 2nd, 1923, Made by *W.D.*, Checked by *W.J.F.*  
**WALTER J. FRANCIS & COMPANY**  
 CONSULTING ENGINEERS





1	DIRECT COSTS . . . . .	\$ 1,693,407.14
2	FIELD SERVICE COSTS . . . . .	153,435.00
3	FIELD OVERHEAD COSTS . . . . .	15,905.66
4	CONSTRUCTION INTEREST . . . . .	73,547.77
5	ADMINISTRATIVE FIELD OVERHEAD COSTS . . . . .	49,621.89
6	HEAD OFFICE OVERHEAD COSTS . . . . .	102,782.23
7	UNWATERING . . . . .	10,350.10
8	CONTINGENCIES . . . . .	0.00
9	HOSPITAL AND MEDICAL SERVICES . . . . .	2,995.00
10	MAIN LINE RAILWAYS AND ROADS . . . . .	36,213.13
11	MISCELLANEOUS ITEMS . . . . .	0.00
12	TOTAL . . . . .	<u>\$ 2,138,257.92</u>

# HYDRO-ELECTRIC INQUIRY COMMISSION

W. D. GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

COST BY CLASSIFICATION

## EXPENDITURE ON BRIDGES

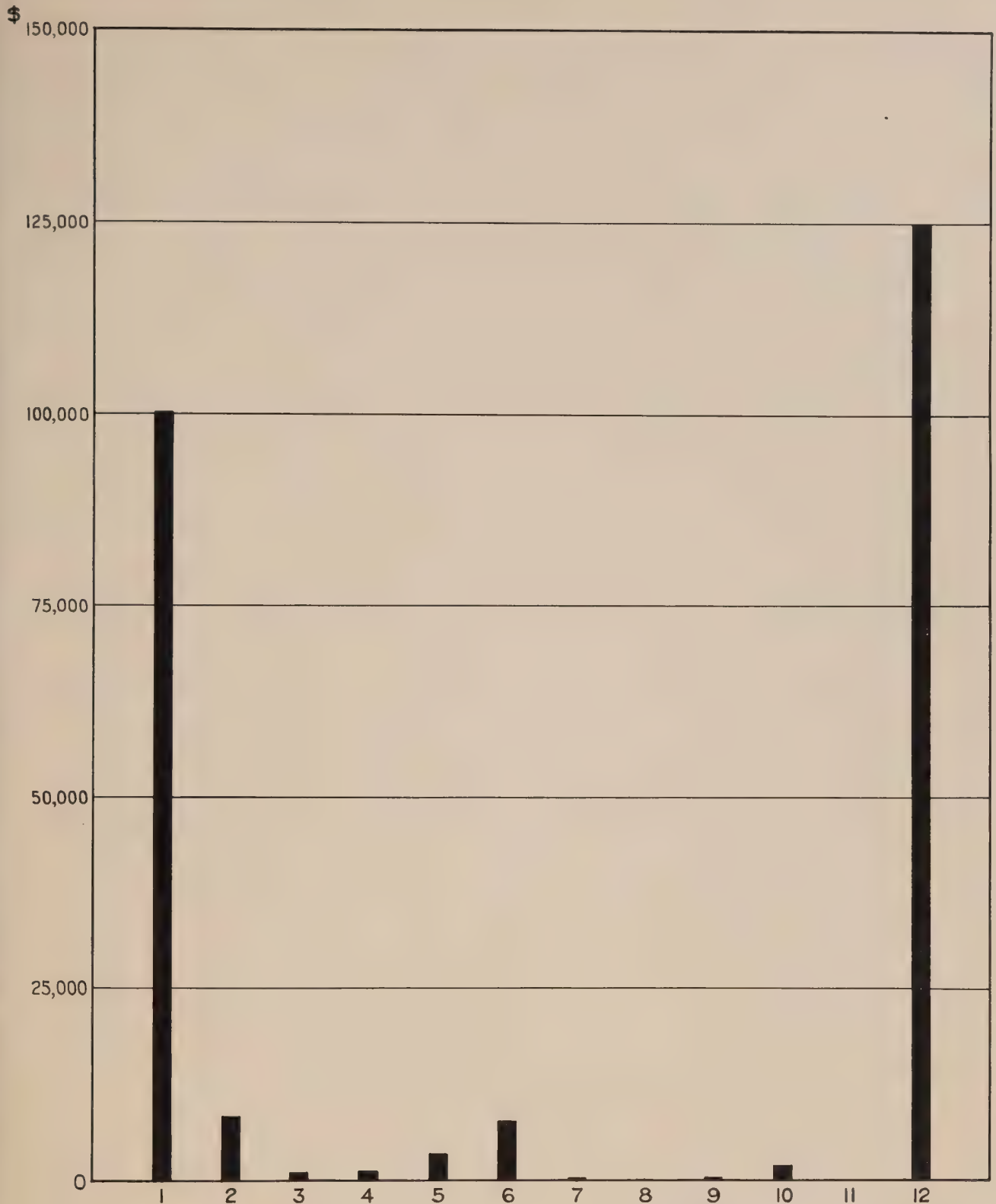
TO MARCH 31<sup>ST</sup> 1922

Toronto, May 2nd., 1923, Made by *W.J.F.*, Checked by *L.H.*

WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS







1	DIRECT COSTS .....	\$ 100,061.87
2	FIELD SERVICE COSTS .....	8,745.00
3	FIELD OVERHEAD COSTS .....	1,070.10
4	CONSTRUCTION INTEREST .....	1,361.99
5	ADMINISTRATIVE FIELD OVERHEAD COSTS .....	3,412.45
6	HEAD OFFICE OVERHEAD COSTS .....	7,896.37
7	UNWATERING .....	187.31
8	CONTINGENCIES .....	0.00
9	HOSPITAL AND MEDICAL SERVICES .....	330.00
10	MAIN LINE RAILWAYS AND ROADS .....	1,906.01
11	MISCELLANEOUS ITEMS .....	0.00
12	TOTAL .....	\$ 124,971.10

# HYDRO-ELECTRIC INQUIRY COMMISSION

W. D. GREGORY, CHAIRMAN

## QUEENSTON-CHIPPAWA POWER DEVELOPMENT

COST BY CLASSIFICATION

## EXPENDITURE ON MISCELLANEOUS ITEMS

TO MARCH 31<sup>ST</sup> 1922

Toronto, May 2nd, 1923, Made by *WJF*, Checked by *WJF*

WALTER J. FRANCIS & COMPANY  
CONSULTING ENGINEERS



**QUEENSTON-CHIPPAWA POWER DEVELOPMENT**  
**GRAND TOTAL OF ALL EXPENDITURE**  
**To MARCH 31<sup>ST</sup> 1922**

44

ELEMENT AND CLASSIFICATION	QUANTITIES		TOTAL COSTS
<b>1. INTAKE</b>			
SHEET PILING .....	187,089	Lin. Ft.	\$ 407,928.23
EARTH IN TEMPORARY DAM .....	139,120	Cu. Yds.	86,679.39
EARTH EXCAVATION .....	537,067	"	463,499.20
ROCK .....			1,375.11
CONCRETE .....			5,608.88
REINFORCED CONCRETE .....			458.20
TOTAL .....			<u>965,549.01</u>
<b>2. WELLAND RIVER</b>			
EARTH EXCAVATION .....	1,194,637	Cu. Yds.	<u>913,907.78</u>
<b>3. CANAL</b>			
EARTH EXCAVATION, CANAL .....	9,651,557	Cu. Yds.	9,981,459.59
" " CONSTRUCTION RYS. ....	567,453	"	174,876.36
TOTAL EARTH EXCAVATION .....	10,219,010	"	<u>10,156,355.95</u>
ROCK EXCAVATION CANAL .....	3,841,247	"	16,274,868.88
" " CONSTRUCTION RYS. ....	25,071	"	189,480.06
TOTAL ROCK EXCAVATION .....	3,866,318	"	<u>16,464,348.94</u>
DREDGING .....	1,256,068	"	1,003,780.92
CONCRETE .....	304,299	"	7,300,871.55
STRUCTURAL STEEL, CONTROL GATE .....			61,289.55
RIP-RAP .....	986,028	"	951,073.71
TOTAL .....			<u>35,937,700.62</u>
<b>4. FOREBAY</b>			
EARTH EXCAVATION .....	49,082	Cu. Yds.	29,052.60
ROCK .....	473,590	"	901,705.40
CONCRETE .....	6,440	"	202,721.03
TOTAL .....			<u>1,133,479.03</u>
<b>5. SCREEN HOUSE</b>			
EARTH EXCAVATION .....	1,526	Cu. Yds.	2,245.88
ROCK .....	43,470	"	189,427.79
REINFORCED CONCRETE .....	29,522	"	1,194,088.90
STRUCTURAL STEEL .....			58,118.40
RACKS, GATES AND ICE CHUTE .....	1,449,826	Lbs.	119,840.64
TOTAL .....			<u>1,563,721.61</u>
<b>6. PENSTOCKS</b>			
ROCK EXCAVATION .....	17,836	Cu. Yds.	199,198.74
CONCRETE .....	9,025	"	212,305.16
STEELWORK .....	1,833,350	Lbs.	483,702.00
TOTAL .....			<u>895,205.90</u>
<b>7. POWER HOUSE AND TAILRACE</b>			
EARTH EXCAVATION .....	22,790	Cu. Yds.	25,441.89
ROCK .....	334,596	"	1,282,806.18
CONCRETE .....	38,584	"	1,358,068.96
STRUCTURAL STEEL .....			37,681.90
TOTAL .....			<u>2,703,998.93</u>
<b>7A. HYDRAULIC MACHINERY</b>			
JOHNSON VALVES .....			520,393.08
TURBINES AND AUXILIARY EQUIPMENT .....			1,176,715.23
TOTAL .....			<u>1,697,108.31</u>
<b>7B. ELECTRICAL GENERATION AND PROPORTION OF</b>			<u>3,214,413.15</u>
<b>8. BRIDGES</b>			
TEMPORARY .....			485,486.03
PERMANENT .....			1,652,771.89
TOTAL .....			<u>2,138,257.92</u>
<b>9. RIGHT-OF-WAY</b>			<u>1,423,591.58</u>
<b>9A. MISCELLANEOUS</b>			<u>124,971.10</u>
<b>0. QUEENSTON-POWER HOUSE RAILWAY</b>			<u>200,000.00</u>
<b>1. PLANT SALVAGE</b>			<u>2,958,829.08</u>
<b>2. STORES</b>			<u>1,626,576.36</u>
<b>3. EXPENDITURES, SALVAGING PLANT AND MATERIALS</b>			<u>104,705.18</u>
<b>4. MISCELLANEOUS SALES AND WORK ORDERS</b>			<u>58,359.30</u>
<b>5. SUSPENSE ACCOUNT</b>			<u>3,096.94</u>
<b>6. BOND INTEREST</b>			<u>4,712,127.55</u>
<b>GROSS TOTAL COST</b>			<u>\$ 62,375,599.35</u>
<b>LESS CREDIT REVENUE FROM INTERIM OPERATION</b>			<u>192,975.70</u>
<b>NET TOTAL COST</b>			<u>\$ 62,182,623.65</u>





# QUEENSTON - CHIPPAWA POWER DEVELOPMENT

## DIRECT, FIELD SERVICE AND FIELD OVERHEAD COSTS, AND CONSTRUCTION INTEREST To MARCH 31<sup>ST</sup> 1922

ELEMENT AND CLASSIFICATION		QUANTITIES		(16)	
				TOTAL COSTS	UNIT COSTS
1. INTAKE					
SHEET PILING .....		187,089	Lin. Ft.	\$ 381,559.57	\$ 2.0399
EARTH IN TEMPORARY DAM .....		139,120	Cu. Yds.	73,940.75	0.5316
EARTH EXCAVATION .....		537,067	"	410,598.66	0.7645
ROCK .....				1,341.16	....
CONCRETE .....				4,200.80	....
REINFORCED CONCRETE .....				456.95	....
TOTAL .....				<u>872,097.89</u>	....
2. WELLAND RIVER					
EARTH EXCAVATION .....		1,194,637	Cu. Yds.	<u>857,295.74</u>	0.7178
3. CANAL					
EARTH EXCAVATION, CANAL .....		9,651,557	Cu. Yds.	7,804,713.43	0.8087
" " CONSTRUCTION RYS. ....		567,453	"	7,804,713.43	....
TOTAL EARTH EXCAVATION .....		10,219,010	"	<u>7,804,713.43</u>	....
ROCK EXCAVATION CANAL .....		3,841,247	"	13,688,472.09	3.5635
" " CONSTRUCTION RYS. ....		25,071	"	13,688,472.09	....
TOTAL ROCK EXCAVATION .....		3,866,318	"	<u>13,688,472.09</u>	....
DREDGING .....		1,256,068	"	952,832.58	0.7586
CONCRETE .....		304,299	"	6,551,429.10	21.5296
STRUCTURAL STEEL, CONTROL GATE .....				57,754.00	....
RIP-RAP .....		986,028	"	762,129.37	0.7733
TOTAL .....				<u>29,817,330.57</u>	....
4. FOREBAY					
EARTH EXCAVATION .....		49,082	Cu. Yds.	24,815.52	0.5056
ROCK .....		473,590	"	797,063.41	1.6829
CONCRETE .....		6,440	"	180,524.74	28.0318
TOTAL .....				<u>1,002,403.67</u>	....
5. SCREEN HOUSE					
EARTH EXCAVATION .....		1,526	Cu. Yds.	1,930.08	1.2646
ROCK .....		43,470	"	159,928.88	3.6788
REINFORCED CONCRETE .....		29,522	"	1,039,522.52	35.2118
STRUCTURAL STEEL .....				48,117.16	....
RACKS, GATES AND ICE CHUTE .....		1,449,826	Lbs.	113,896.13	0.0786
TOTAL .....				<u>1,363,394.77</u>	....
6. PENSTOCKS					
ROCK EXCAVATION .....		17,836	Cu. Yds.	166,443.58	9.3318
CONCRETE .....		9,025	"	179,021.50	19.8362
STEELWORK .....		1,833,350	Lbs.	448,210.45	0.2445
TOTAL .....				<u>793,675.53</u>	....
7. POWER HOUSE AND TAILRACE					
EARTH EXCAVATION .....		22,790	Cu. Yds.	20,013.67	0.8782
ROCK .....		334,596	"	1,087,796.37	3.2512
CONCRETE .....		38,584	"	1,165,117.89	30.1969
STRUCTURAL STEEL .....				33,265.77	....
TOTAL .....				<u>2,306,193.70</u>	....
7A. HYDRAULIC MACHINERY					
JOHNSON VALVES .....				489,026.45	....
TURBINES AND AUXILIARY EQUIPMENT .....				<u>1,108,490.58</u>	....
TOTAL .....				<u>1,597,517.03</u>	....
7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE					
				<u>3,058,958.99</u>	....
8. BRIDGES					
TEMPORARY .....				431,258.34	....
PERMANENT .....				<u>1,505,037.23</u>	....
TOTAL .....				<u>1,936,295.57</u>	....
9. RIGHT-OF-WAY					
9A. MISCELLANEOUS					
0. QUEENSTON-POWER HOUSE RAILWAY .....				111,238.96	....
1. PLANT SALVAGE .....				....	....
2. STORES .....				....	....
3. EXPENDITURES, SALVAGING PLANT AND MATERIALS .....				....	....
4. MISCELLANEOUS SALES AND WORK ORDERS .....				....	....
5. SUSPENSE ACCOUNT .....				....	....
6. BOND INTEREST .....				....	....
GROSS TOTAL COST .....				\$ 43,716,402.42	....
LESS CREDIT REVENUE FROM INTERIM OPERATION .....				....	....
NET TOTAL COST .....				....	....



QUEENSTON - CHIPPAWA POWER DEVELOPMENT  
ADMINISTRATIVE FIELD OVERHEAD COSTS  
TO MARCH 31<sup>ST</sup> 1922

ELEMENT AND CLASSIFICATION		QUANTITIES		(22) TOTAL COSTS UNIT COSTS	
1. INTAKE					
	SHEET PILING	187,089	Lin. Ft.	\$ 7,229.36	\$ 0.0386
	EARTH IN TEMPORARY DAM	139,120	Cu. Yds.	4,117.65	0.0296
	EARTH EXCAVATION	537,067	"	6,743.86	0.0125
	ROCK			11.95	....
	CONCRETE			514.55	....
	REINFORCED CONCRETE				....
	TOTAL			<u>18,617.37</u>	....
2. WELLAND RIVER					
	EARTH EXCAVATION	1,194,637	Cu. Yds.	<u>13,638.13</u>	0.0114
3. CANAL					
	EARTH EXCAVATION, CANAL	9,651,557	Cu. Yds.	101,946.52	0.0106
	" " CONSTRUCTION RYS.	567,453	"		....
	TOTAL EARTH EXCAVATION	10,219,010	"	<u>101,946.52</u>	....
	ROCK EXCAVATION CANAL	3,841,247	"	206,187.25	0.0537
	" " CONSTRUCTION RYS.	25,071	"		....
	TOTAL ROCK EXCAVATION	3,866,318	"	<u>206,187.25</u>	....
	DREDGING	1,256,068	"	9,335.55	0.0074
	CONCRETE	304,299	"	135,503.10	0.4450
	STRUCTURAL STEEL, CONTROL GATE			1,207.55	
	RIP-RAP	986,028	"	14,225.79	0.0144
	TOTAL			<u>468,405.76</u>	....
4. FOREBAY					
	EARTH EXCAVATION	49,082	Cu. Yds.	360.05	0.0073
	ROCK	473,590	"	10,840.85	0.0229
	CONCRETE	6,440	"	4,719.74	0.7329
	TOTAL			<u>15,920.64</u>	....
5. SCREEN HOUSE					
	EARTH EXCAVATION	1,526	Cu. Yds.	28.06	0.0184
	ROCK	43,470	"	2,590.42	0.0596
	REINFORCED CONCRETE	29,522	"	34,047.25	1.1531
	STRUCTURAL STEEL			3,394.33	
	RACKS, GATES AND ICE CHUTE	1,449,826	Lbs.	1,468.65	0.0010
	TOTAL			<u>41,528.71</u>	....
6. PENSTOCKS					
	ROCK EXCAVATION	17,836	Cu. Yds.	3,180.35	0.1783
	CONCRETE	9,025	"	4,373.82	0.4846
	STEELWORK	1,833,350	Lbs.	10,752.76	0.0058
	TOTAL			<u>18,306.93</u>	....
7. POWER HOUSE AND TAILRACE					
	EARTH EXCAVATION	22,790	Cu. Yds.	356.24	0.0156
	ROCK	334,596	"	26,208.92	0.0783
	CONCRETE	38,584	"	43,008.53	1.1146
	STRUCTURAL STEEL			1,291.63	
	TOTAL			<u>70,865.32</u>	....
7A. HYDRAULIC MACHINERY					
	JOHNSON VALVES			10,387.10	....
	TURBINES AND AUXILIARY EQUIPMENT			21,477.60	....
	TOTAL			<u>31,864.70</u>	....
7B. ELECTRICAL GENERATION AND PROPORTION OF					
	SUPERSTRUCTURE			<u>32,893.60</u>	....
8. BRIDGES					
	TEMPORARY			17,217.34	....
	PERMANENT			32,404.55	....
	TOTAL			<u>49,621.89</u>	....
9. RIGHT-OF-WAY					
9A. MISCELLANEOUS					
	QUEENSTON-POWER HOUSE RAILWAY			3,412.45	....
1. PLANT SALVAGE					....
2. STORES					....
3. EXPENDITURES, SALVAGING PLANT AND MATERIALS					....
4. MISCELLANEOUS SALES AND WORK ORDERS					....
5. SUSPENSE ACCOUNT					....
6. BOND INTEREST					....
GROSS TOTAL COST				<u>\$ 765,075.50</u>	....
LESS CREDIT REVENUE FROM INTERIM OPERATION					....
NET TOTAL COST					....





**QUEENSTON - CHIPPAWA POWER DEVELOPMENT**  
**HEAD OFFICE OVERHEAD COSTS**  
**TO MARCH 31ST 1922**

(38)

ELEMENT AND CLASSIFICATION		QUANTITIES	TOTAL COSTS	UNIT COSTS
<b>1. INTAKE</b>				
SHEET PILING	187,089 Lin. Ft.		\$16,287.20	\$ 0.0867
EARTH IN TEMPORARY DAM	139,120 Cu. Yds.		8,387.70	0.0603
EARTH EXCAVATION	537,067 "		15,524.31	0.0289
ROCK	"		22.00	....
CONCRETE	"		893.53	....
REINFORCED CONCRETE	"		1.25	....
TOTAL	"		<u>41,115.99</u>	....
<b>2. WELLAND RIVER</b>				
EARTH EXCAVATION	1,194,637 Cu. Yds.		<u>32,095.65</u>	0.0267
<b>3. CANAL</b>				
EARTH EXCAVATION, CANAL	9,651,557 Cu. Yds.		300,217.35	0.0311
" " CONSTRUCTION RYS.	567,453 "		....	....
TOTAL EARTH EXCAVATION	10,219,010 "		<u>300,217.35</u>	....
ROCK EXCAVATION CANAL	3,841,247 "		540,715.66	0.1408
" " CONSTRUCTION RYS.	25,071 "		....	....
TOTAL ROCK EXCAVATION	3,866,318 "		<u>540,715.66</u>	....
DREDGING	1,256,068 "		24,081.69	0.0192
CONCRETE	304,299 "		303,031.22	0.9958
STRUCTURAL STEEL, CONTROL GATE	"		2,187.00	....
RIP-RAP	986,028 "		33,513.35	0.0339
TOTAL	"		<u>1,203,746.27</u>	....
<b>4. FOREBAY</b>				
EARTH EXCAVATION	49,082 Cu. Yds.		841.66	0.0172
ROCK	473,590 "		26,165.43	0.0553
CONCRETE	6,440 "		10,098.12	1.5681
TOTAL	"		<u>37,105.21</u>	....
<b>5. SCREEN HOUSE</b>				
EARTH EXCAVATION	1,526 Cu. Yds.		52.48	0.0344
ROCK	43,470 "		6,164.46	0.1419
REINFORCED CONCRETE	29,522 "		71,940.63	2.4369
STRUCTURAL STEEL	"		6,353.63	....
RACKS, GATES AND ICE CHUTE	1,449,826 Lbs.		3,473.98	0.0023
TOTAL	"		<u>87,985.18</u>	....
<b>6. PENSTOCKS</b>				
ROCK EXCAVATION	17,836 Cu. Yds.		7,182.96	0.4027
CONCRETE	9,025 "		15,487.98	1.7161
STEELWORK	1,833,350 Lbs.		23,477.14	0.0128
TOTAL	"		<u>46,148.08</u>	....
<b>7. POWER HOUSE AND TAILRACE</b>				
EARTH EXCAVATION	22,790 Cu. Yds.		837.93	0.0378
ROCK	334,596 "		63,666.79	0.1901
CONCRETE	38,584 "		94,460.07	2.4482
STRUCTURAL STEEL	"		2,709.36	....
TOTAL	"		<u>161,674.15</u>	....
<b>7A. HYDRAULIC MACHINERY</b>				
JOHNSON VALVES	"		18,978.34	....
TURBINES AND AUXILIARY EQUIPMENT	"		41,868.26	....
TOTAL	"		<u>60,846.60</u>	....
<b>7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE</b>				
"	"		<u>73,652.00</u>	....
<b>8. BRIDGES</b>				
TEMPORARY	"		33,096.61	....
PERMANENT	"		69,685.62	....
TOTAL	"		<u>102,782.23</u>	....
<b>9. RIGHT-OF-WAY</b>				
9A. MISCELLANEOUS	"		7,896.57	....
<b>10. QUEENSTON-POWER HOUSE RAILWAY</b>				
<b>11. PLANT SALVAGE</b>				
<b>12. STORES</b>				
<b>13. EXPENDITURES, SALVAGING PLANT AND MATERIALS</b>				
<b>14. MISCELLANEOUS SALES AND WORK ORDERS</b>				
<b>15. SUSPENSE ACCOUNT</b>				
<b>16. BOND INTEREST</b>				
<b>GROSS TOTAL COST</b>			<u>\$ 1,855,047.73</u>	....
<b>LESS CREDIT REVENUE FROM INTERIM OPERATION</b>				
<b>NET TOTAL COST</b>				







# QUEENSTON-CHIPPAWA

## UNWATERING, CONTINGENCIES, HOSPITAL AND MEDICAL SERVICES

ELEMENT AND CLASSIFICATION		QUANTITIES		(39) UNWATERING TOTAL COSTS	UNIT COSTS
1. INTAKE				\$	\$
	SHEET PILING	187,089	Lin. Ft.		
	EARTH IN TEMPORARY DAM	139,120	Cu. Yds.		
	EARTH EXCAVATION	537,067	"	24,148.18	0.0450
	ROCK				
	CONCRETE				
	REINFORCED CONCRETE				
	TOTAL			<u>24,148.18</u>	
2. WELLAND RIVER					
	EARTH EXCAVATION	1,194,637	Cu. Yds.		
3. CANAL					
	EARTH EXCAVATION, CANAL	9,651,557	Cu. Yds.	773,147.96	0.0802
	" " CONSTRUCTION RYS.	567,453	"		
	TOTAL EARTH EXCAVATION	10,219,010	"	<u>773,147.96</u>	
	ROCK EXCAVATION CANAL	3,841,247	"	811,540.00	0.2112
	" " CONSTRUCTION RYS.	25,071	"		
	TOTAL ROCK EXCAVATION	3,866,318	"	<u>811,540.00</u>	
	DREDGING	1,256,068	"		
	CONCRETE	304,299	"	38,900.00	0.1277
	STRUCTURAL STEEL, CONTROL GATE				
	RIP-RAP	986,028	"	<u>21,600.00</u>	0.0218
	TOTAL			<u>1,645,187.96</u>	
4. FOREBAY					
	EARTH EXCAVATION	49,082	Cu. Yds.	221.00	0.0045
	ROCK	473,590	"	12,100.00	0.0256
	CONCRETE	6,440	"	779.00	0.1296
	TOTAL			<u>13,100.00</u>	
5. SCREEN HOUSE					
	EARTH EXCAVATION	1,526	Cu. Yds.	14.00	0.0091
	ROCK	43,470	"	2,425.00	0.0558
	REINFORCED CONCRETE	29,522	"	2,734.00	0.0926
	STRUCTURAL STEEL				
	RACKS, GATES AND ICE CHUTE	1,449,826	Lbs.		
	TOTAL			<u>5,173.00</u>	
6. PENSTOCKS					
	ROCK EXCAVATION	17,836	Cu. Yds.	109.00	0.0061
	CONCRETE	9,025	"	2,645.01	0.2931
	STEELWORK	1,833,350	Lbs.	2.60	
	TOTAL			<u>2,756.61</u>	
7. POWER HOUSE AND TAILRACE					
	EARTH EXCAVATION	22,790	Cu. Yds.	369.00	0.0162
	ROCK	334,596	"	17,971.00	0.0537
	CONCRETE	38,584	"	5,185.00	0.1344
	STRUCTURAL STEEL				
	TOTAL			<u>23,525.00</u>	
7A. HYDRAULIC MACHINERY					
	JOHNSON VALVES			801.00	
	TURBINES AND AUXILIARY EQUIPMENT			1,270.00	
	TOTAL			<u>2,071.00</u>	
7B. ELECTRICAL GENERATION AND PROPORTION OF					
8. BRIDGES			SUPERSTRUCTURE	<u>18,307.30</u>	
	TEMPORARY				
	PERMANENT			<u>10,350.10</u>	
	TOTAL			<u>10,350.10</u>	
9. RIGHT-OF-WAY					
9A. MISCELLANEOUS					
	QUEENSTON-POWER HOUSE RAILWAY			187.31	
11. PLANT SALVAGE					
12. STORES					
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS					
14. MISCELLANEOUS SALES AND WORK ORDERS					
15. SUSPENSE ACCOUNT					
16. BOND INTEREST					
GROSS TOTAL COST				<u>\$ 1,744,806.46</u>	
LESS CREDIT REVENUE FROM INTERIM OPERATION					
NET TOTAL COST					

## POWER DEVELOPMENT

## MAIN LINE RAILWAYS AND ROADS AND MISCELLANEOUS ITEMS

To MARCH 31<sup>ST</sup> 1922

④0 CONTINGENCIES (STRIKE)		④1 HOSPITAL AND MEDICAL SERVICES		④2 MAIN LINE RAILWAYS AND ROADS		④3 MISCELLANEOUS ITEMS	
TOTAL COSTS	UNIT COSTS	TOTAL COSTS	UNIT COSTS	TOTAL COSTS	UNIT COSTS	TOTAL COSTS	UNIT COSTS
\$ .....	\$ .....	\$ 1,044.00	\$ 0.0056	\$ 1,808.10	\$ 0.0096	.....	.....
.....	.....	46.00	0.0003	187.29	0.0013	.....	.....
.....	.....	1,276.00	0.0024	5,208.19	0.0097	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	<u>2,366.00</u>	.....	<u>7,203.58</u>	.....	.....	.....
.....	.....	<u>3,030.00</u>	0.0025	<u>7,848.26</u>	0.0066	.....	.....
122,266.00	0.0127	41,000.00	0.0043	838,168.33	0.0870	.....	.....
<u>122,266.00</u>	.....	<u>41,000.00</u>	.....	174,876.36	0.3082	.....	.....
92,240.00	0.0240	67,500.00	0.0176	<u>1,013,044.69</u>	.....	.....	.....
<u>92,240.00</u>	.....	.....	.....	868,213.88	0.2260	.....	.....
.....	.....	<u>67,500.00</u>	.....	189,480.06	7.5577	.....	.....
.....	.....	4,940.00	0.0039	<u>1,057,693.94</u>	.....	.....	.....
.....	.....	16,750.00	0.0557	12,591.10	0.0100	.....	.....
.....	.....	60.00	.....	255,258.13	0.8385	.....	.....
.....	.....	3,880.00	0.0039	81.00	.....	.....	.....
<u>214,506.00</u>	.....	<u>134,130.00</u>	.....	<u>115,725.20</u>	0.1173	.....	.....
.....	.....	.....	.....	<u>2,454,394.06</u>	.....	.....	.....
.....	.....	64.00	0.0013	2,750.37	0.0560	.....	.....
.....	.....	2,140.00	0.0045	53,395.71	0.1128	.....	.....
.....	.....	520.00	0.0808	6,079.43	0.9442	.....	.....
.....	.....	<u>2,724.00</u>	.....	<u>62,225.51</u>	.....	.....	.....
.....	.....	2.00	0.0013	219.26	0.1438	.....	.....
.....	.....	277.00	0.0064	18,042.03	0.4150	.....	.....
.....	.....	2,600.00	0.0881	43,244.50	1.4649	.....	.....
.....	.....	24.00	.....	229.28	.....	.....	.....
.....	.....	91.00	0.0001	910.88	0.0006	.....	.....
.....	.....	<u>2,994.00</u>	.....	<u>62,645.95</u>	.....	.....	.....
.....	.....	540.00	0.0305	21,742.85	1.2190	.....	.....
.....	.....	650.00	0.0720	10,126.85	1.1221	.....	.....
.....	.....	110.00	0.0001	1,149.05	0.0006	.....	.....
.....	.....	<u>1,300.00</u>	.....	<u>33,018.75</u>	.....	.....	.....
.....	.....	88.00	0.0037	3,777.05	0.1657	.....	.....
.....	.....	5,250.00	0.0157	81,913.10	0.2448	.....	.....
.....	.....	2,700.00	0.0700	47,597.47	1.2336	.....	.....
.....	.....	2.00	.....	413.14	.....	.....	.....
.....	.....	<u>8,040.00</u>	.....	<u>133,700.76</u>	.....	.....	.....
.....	.....	205.00	.....	995.19	.....	.....	.....
.....	.....	820.00	.....	2,788.79	.....	.....	.....
.....	.....	<u>1,025.00</u>	.....	<u>3,783.98</u>	.....	.....	.....
.....	.....	<u>1,603.56</u>	.....	<u>28,997.70</u>	.....	.....	.....
.....	.....	220.00	.....	3,693.74	.....	.....	.....
.....	.....	<u>2,775.00</u>	.....	<u>32,519.39</u>	.....	.....	.....
.....	.....	<u>2,995.00</u>	.....	<u>36,213.13</u>	.....	.....	.....
.....	.....	330.00	.....	1,906.01	.....	\$ 1,423,591.58	.....
.....	.....	.....	.....	.....	.....	200,000.00	.....
.....	.....	.....	.....	.....	.....	2,958,829.08	.....
.....	.....	.....	.....	.....	.....	1,626,576.36	.....
.....	.....	.....	.....	.....	.....	104,705.18	.....
.....	.....	.....	.....	.....	.....	58,359.30	.....
.....	.....	.....	.....	.....	.....	3,096.94	.....
.....	.....	.....	.....	.....	.....	4,712,127.55	.....
<u>\$ 214,506.00</u>	.....	<u>\$ 160,537.56</u>	.....	<u>\$ 2,831,937.69</u>	.....	<u>\$ 11,087,285.99</u>	.....







# QUEENSTON-CHIPPAWA DETAILS OF

ELEMENT AND CLASSIFICATION	QUANTITIES	MATERIALS AND PERMANENT MACHINERY	
		COSTS	UNIT COSTS
1. INTAKE			
SHEET PILING .....	187,089 Lin.Ft.	\$ 80,549.29	\$ 0.4306
EARTH IN TEMPORARY DAM .....	139,120 Cu.Yds.	29,830.00	0.2145
EARTH EXCAVATION .....	537,067 "	53,886.94	0.1004
ROCK " .....	.....	1,275.68	.....
CONCRETE .....	.....	2,998.87	.....
REINFORCED CONCRETE .....	.....	454.76	.....
TOTAL .....	.....	<u>168,995.54</u>	.....
2. WELLAND RIVER			
EARTH EXCAVATION .....	1,194,637 Cu.Yds.	<u>132,669.59</u>	0.1111
3. CANAL			
EARTH EXCAVATION, CANAL .....	9,651,557 Cu.Yds.	678,112.29	0.0703
" " CONSTRUCTION RYS. ....	567,453 "	.....	.....
TOTAL EARTH EXCAVATION .....	10,219,010 "	<u>678,112.29</u>	.....
ROCK EXCAVATION CANAL .....	3,841,247 "	2,111,936.94	0.5498
" " CONSTRUCTION RYS. ....	25,071 "	.....	.....
TOTAL ROCK EXCAVATION .....	3,866,318 "	<u>2,111,936.94</u>	.....
DREDGING .....	1,256,068 "	311,944.07	0.2483
CONCRETE .....	304,299 "	2,540,900.07	8.3500
STRUCTURAL STEEL, CONTROL GATE .....	.....	53,146.69	.....
RIP-RAP .....	986,028 "	<u>93,195.32</u>	0.0945
TOTAL .....	.....	<u>5,789,235.38</u>	.....
4. FOREBAY			
EARTH EXCAVATION .....	49,082 Cu.Yds.	1,573.77	0.0321
ROCK " .....	473,590 "	158,116.56	0.3340
CONCRETE .....	6,440 "	65,518.03	10.1736
TOTAL .....	.....	<u>225,208.36</u>	.....
5. SCREEN HOUSE			
EARTH EXCAVATION .....	1,526 Cu.Yds.	15.00	0.0094
ROCK " .....	43,470 "	34,826.84	0.8011
REINFORCED CONCRETE .....	29,522 "	479,495.46	16.2420
STRUCTURAL STEEL .....	.....	28,741.43	.....
RACKS, GATES AND ICE CHUTE .....	1,449,826 Lbs.	87,222.61	0.0603
TOTAL .....	.....	<u>630,301.34</u>	.....
6. PENSTOCKS			
ROCK EXCAVATION .....	17,836 Cu.Yds.	21,468.38	1.2036
CONCRETE .....	9,025 "	92,685.13	10.2690
STEELWORK .....	1,833,350 Lbs.	424,807.19	0.0232
TOTAL .....	.....	<u>538,960.70</u>	.....
7. POWER HOUSE AND TAILRACE			
EARTH EXCAVATION .....	22,790 Cu.Yds.	244.09	0.0108
ROCK " .....	334,596 "	112,505.31	0.3357
CONCRETE .....	38,584 "	478,615.92	12.4044
STRUCTURAL STEEL .....	.....	25,544.53	.....
TOTAL .....	.....	<u>616,909.85</u>	.....
7A. HYDRAULIC MACHINERY			
JOHNSON VALVES .....	.....	454,915.74	.....
TURBINES AND AUXILIARY EQUIPMENT .....	.....	993,779.12	.....
TOTAL .....	.....	<u>1,448,694.86</u>	.....
7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE			
8. BRIDGES			
TEMPORARY .....	.....	186,825.38	.....
PERMANENT .....	.....	603,684.26	.....
TOTAL .....	.....	<u>790,509.64</u>	.....
9. RIGHT-OF-WAY			
9A. MISCELLANEOUS .....	.....	24,039.62	.....
10. QUEENSTON-POWER HOUSE RAILWAY			
11. PLANT SALVAGE .....	.....	.....	.....
12. STORES .....	.....	.....	.....
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS			
14. MISCELLANEOUS SALES AND WORK ORDERS			
15. SUSPENSE ACCOUNT .....	.....	.....	.....
16. BOND INTEREST .....	.....	.....	.....
GROSS TOTAL COST .....	.....	<u>\$ 12,673,879.02</u>	.....
LESS CREDIT REVENUE FROM INTERIM OPERATION .....	.....	.....	.....
NET TOTAL COST .....	.....	.....	.....

## POWER DEVELOPMENT DIRECT COSTS

TO MARCH 31<sup>ST</sup> 1922

(2) LABOUR		(3) PLANT		(4) CONSTRUCTION SUPERINTENDENCE	
COSTS	UNIT COSTS	COSTS	UNIT COSTS	COSTS	UNIT COSTS
\$ 73,535.56	\$ 0.3930	\$196,960.20	\$1.0529	\$1,330.00	\$ 0.0072
15,965.55	0.1148	20,826.00	0.1497	763.00	0.0055
133,684.75	0.2490	88,522.10	0.1648	1,250.00	0.0023
57.79	...	...	...	2.00	...
500.21	...	91.00	...	95.00	...
223,743.86	...	306,399.30	...	3,440.00	...
247,692.07	0.2074	148,771.68	0.1245	2,500.00	0.0021
2,162,010.92	0.2240	2,205,763.73	0.2286	18,885.00	0.0020
2,162,010.92	...	2,205,763.73	...	18,885.00	...
4,423,812.46	1.1517	2,700,323.52	0.7029	38,750.00	0.0100
4,423,812.46	...	2,700,323.52	...	38,750.00	...
161,567.23	0.1286	340,743.00	0.2713	1,736.00	0.0014
1,280,521.99	4.2081	2,011,119.99	6.6090	25,105.00	0.0825
3,363.29	...	30.00	...	225.00	...
259,762.57	0.2635	289,903.14	0.2940	2,636.50	0.0028
8,291,038.46	...	7,547,883.38	...	86,837.50	...
10,564.03	0.2152	7,228.47	0.1472	66.50	0.0014
264,650.13	0.5588	149,928.16	0.3161	2,016.52	0.0043
55,969.98	8.6910	41,476.00	6.4404	875.00	0.1359
331,184.14	...	198,632.63	...	2,958.02	...
486.88	0.3190	908.90	0.5956	5.35	0.0035
60,179.22	1.3843	23,752.79	0.5463	480.00	0.0110
312,133.63	10.5726	145,212.79	4.9198	6,310.00	0.2137
15,608.99	...	764.00	...	629.00	...
13,882.95	0.0096	1,270.40	0.0009	272.50	0.0001
402,291.67	...	171,908.88	...	7,696.85	...
83,833.51	4.7002	20,254.40	1.1355	585.00	0.0328
38,935.83	4.3144	23,528.77	2.6079	815.00	0.0903
9,548.07	0.0005	5,760.00	0.0003	1,975.00	0.0001
132,317.41	...	49,543.17	...	3,375.00	...
4,820.96	0.2116	5,223.19	0.2292	66.68	0.0030
470,596.65	1.4100	162,184.73	0.4820	4,925.00	0.0147
378,347.80	9.8059	177,981.82	4.6129	7,950.00	0.2060
5,405.10	...	1,139.00	...	239.50	...
859,170.51	...	346,528.74	...	13,181.18	...
20,932.71	...	3,509.68	...	1,927.50	...
67,588.97	...	10,979.34	...	3,975.00	...
88,521.68	...	14,489.02	...	5,902.50	...
513,046.64	...	71,004.00	...	6,060.00	...
173,705.14	...	14,736.36	...	3,195.00	...
565,798.56	...	139,452.44	...	6,010.00	...
739,503.70	...	154,188.80	...	9,205.00	...
70,660.41	...	4,732.84	...	629.00	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...					







# QUEENSTON-CHIPPAWA DETAILS OF

ELEMENT AND CLASSIFICATION	QUANTITIES	5 POWER, LIGHT AND TELEPHONE	
		COSTS	UNIT COSTS
1. INTAKE			
SHEET PILING	187,089 Lin. Ft.	\$ 1,092.00	\$ 0.0059
EARTH IN TEMPORARY DAM	139,120 Cu. Yds.	61.00	0.0004
EARTH EXCAVATION	537,067 "	1,676.00	0.0031
ROCK	"	.....	.....
CONCRETE	"	.....	.....
REINFORCED CONCRETE	"	.....	.....
TOTAL	"	<u>2,829.00</u>	.....
2. WELLAND RIVER			
EARTH EXCAVATION	1,194,637 Cu. Yds.	<u>43,960.50</u>	0.0368
3. CANAL			
EARTH EXCAVATION, CANAL	9,651,557 Cu. Yds.	416,139.00	0.0431
" " CONSTRUCTION RYS.	567,453 "	<u>416,139.00</u>	.....
TOTAL EARTH EXCAVATION	10,219,010 "	620,114.00	0.1614
ROCK EXCAVATION CANAL	3,841,247 "	25,071.00	.....
" " CONSTRUCTION RYS.	25,071 "	<u>620,114.00</u>	.....
TOTAL ROCK EXCAVATION	3,866,318 "	445.00	0.0004
DREDGING	1,256,068 "	92,114.45	0.3025
CONCRETE	304,299 "	1,994.50	0.0020
STRUCTURAL STEEL, CONTROL GATE	986,028 "	<u>1,130,806.95</u>	.....
RIP-RAP	"	.....	.....
TOTAL	"	.....	.....
4. FOREBAY			
EARTH EXCAVATION	49,082 Cu. Yds.	1,199.90	0.0244
ROCK	473,590 "	39,887.50	0.0843
CONCRETE	6,440 "	2,425.00	0.3770
TOTAL	"	<u>43,512.40</u>	.....
5. SCREEN HOUSE			
EARTH EXCAVATION	1,526 Cu. Yds.	312.13	0.2045
ROCK	43,470 "	6,161.50	0.1419
REINFORCED CONCRETE	29,522 "	8,757.00	0.2965
STRUCTURAL STEEL	"	.....	.....
RACKS, GATES AND ICE CHUTE	1,449,826 Lbs.	146.00	0.0001
TOTAL	"	<u>15,376.63</u>	.....
6. PENSTOCKS			
ROCK EXCAVATION	17,836 Cu. Yds.	3,700.00	0.2075
CONCRETE	9,025 "	5,629.00	0.6237
STEELWORK	1,833,350 Lbs.	661.00	.....
TOTAL	"	<u>9,990.00</u>	.....
7. POWER HOUSE AND TAILRACE			
EARTH EXCAVATION	22,790 Cu. Yds.	1,423.50	0.0626
ROCK	334,596 "	30,932.00	0.0925
CONCRETE	38,584 "	9,700.00	0.2514
STRUCTURAL STEEL	"	.....	.....
TOTAL	"	<u>42,055.50</u>	.....
7A. HYDRAULIC MACHINERY			
JOHNSON VALVES	"	159.00	.....
TURBINES AND AUXILIARY EQUIPMENT	"	1,450.00	.....
TOTAL	"	<u>1,609.00</u>	.....
7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE			
TOTAL	"	<u>13,496.63</u>	.....
8. BRIDGES			
TEMPORARY	"	942.00	.....
PERMANENT	"	22,285.00	.....
TOTAL	"	<u>23,227.00</u>	.....
9. RIGHT-OF-WAY			
9A. MISCELLANEOUS	"	824.00	.....
10. QUEENSTON-POWER HOUSE RAILWAY			
11. PLANT SALVAGE			
12. STORES			
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS			
14. MISCELLANEOUS SALES AND WORK ORDERS			
15. SUSPENSE ACCOUNT			
16. BOND INTEREST			
GROSS TOTAL COST		\$ <u>1,327,687.61</u>	.....
LESS CREDIT REVENUE FROM INTERIM OPERATION			
NET TOTAL COST			

## POWER DEVELOPMENT FIELD SERVICE COSTS

TO MARCH 31<sup>ST</sup> 1922

⑥ COMPRESSED AIR		⑦ WATER SUPPLY		⑧ GARAGE AND STABLES		⑨ SANITATION AND CAMPS		⑩ PLANT REPAIRS		⑪ MISCELLANEOUS	
COSTS	UNIT COSTS	COSTS	UNIT COSTS	COSTS	UNIT COSTS	COSTS	UNIT COSTS	COSTS	UNIT COSTS	COSTS	UNIT COSTS
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
.....	.....	.....	.....	1,439.60	0.0077	6,098.00	0.0326	8,766.00	0.0469	.....	.....
.....	.....	.....	.....	227.00	0.0016	416.00	0.0030	3,160.85	0.0227	.....	.....
.....	.....	.....	.....	8,559.00	0.0159	10,058.00	0.0187	90,690.65	0.1689	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	<u>10,225.60</u>	.....	<u>16,572.00</u>	.....	<u>102,617.50</u>	.....	.....	.....
.....	.....	.....	.....	<u>13,307.00</u>	0.0113	<u>24,031.00</u>	0.0201	<u>204,632.00</u>	0.1713	.....	.....
2,765.00	0.0003	59,922.00	0.0062	143,842.00	0.0149	333,016.00	0.0345	1,339,959.00	0.1387	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<u>2,765.00</u>	.....	<u>59,922.00</u>	.....	<u>143,842.00</u>	.....	<u>333,016.00</u>	.....	<u>1,339,959.00</u>	.....	.....	.....
712,196.00	0.1854	42,712.00	0.0111	84,749.00	0.0221	538,314.67	0.1401	1,896,029.65	0.4936	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<u>712,196.00</u>	.....	<u>42,712.00</u>	.....	<u>84,749.00</u>	.....	<u>538,314.67</u>	.....	<u>1,896,029.65</u>	.....	.....	.....
32,250.00	0.1059	505.00	0.0004	4,310.00	0.0034	39,880.40	0.0318	67,700.00	0.0539	.....	.....
.....	.....	73,750.00	0.2424	31,950.00	0.1050	114,938.00	0.3777	140,490.00	0.4617	22,410.00	0.0738
.....	.....	.....	.....	117.44	.....	350.00	.....	80.30	.....	.....	.....
63.81	0.0001	<u>1,230.00</u>	0.0012	2419.00	0.0025	30,670.00	0.0312	49,310.00	0.0500	.....	.....
<u>747,274.81</u>	.....	<u>178,119.00</u>	.....	<u>267,387.44</u>	.....	<u>1,057,169.07</u>	.....	<u>3,493,568.95</u>	.....	<u>22,410.00</u>	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
89.00	0.0018	255.00	0.0052	753.45	0.0154	520.00	0.0106	1,633.00	0.0333	.....	.....
16,000.00	0.0338	2,530.00	0.0053	15,511.50	0.0328	16,900.00	0.0357	78,202.00	0.1651	.....	.....
.....	.....	1,775.00	0.2755	.....	.....	4,110.00	0.6380	3,050.14	0.4730	.....	.....
<u>16,089.00</u>	.....	<u>4,560.00</u>	.....	<u>16,264.95</u>	.....	<u>21,530.00</u>	.....	<u>82,885.14</u>	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	17.00	0.0112	25.00	0.0163	14.00	0.0092	128.00	0.0839	.....	.....
6,427.50	0.1479	860.00	0.0198	1,471.00	0.0339	2,195.00	0.0505	14,790.00	0.3400	.....	.....
6,325.00	0.2141	8,963.00	0.3035	1,743.38	0.0591	20,524.00	0.6952	15,425.02	0.5224	3,970.00	0.1344
.....	.....	178.00	.....	.....	.....	251.00	.....	571.00	.....	.....	.....
.....	.....	<u>233.00</u>	0.0001	.....	.....	750.00	0.0005	1,064.00	0.0008	7,983.63	0.0055
<u>12,752.50</u>	.....	<u>10,251.00</u>	.....	<u>3,239.38</u>	.....	<u>23,734.00</u>	.....	<u>31,978.02</u>	.....	<u>11,953.63</u>	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8,148.00	0.4568	1,170.00	0.0656	327.00	0.0183	4,355.00	0.2442	17,233.41	0.9662	.....	.....
528.00	0.0585	900.00	0.0997	800.00	0.0886	7,175.00	0.7950	4,594.00	0.5090	.....	.....
.....	.....	.....	.....	.....	.....	950.00	0.0001	674.40	.....	.....	.....
<u>8,676.00</u>	.....	<u>2,070.00</u>	.....	<u>1,127.00</u>	.....	<u>12,480.00</u>	.....	<u>22,501.81</u>	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3.50	.....	355.00	0.0157	453.00	0.0200	692.00	0.0304	4,888.66	0.2146	935.00	0.0412
38,050.00	0.1136	8,640.00	0.0257	10,348.00	0.0308	42,400.00	0.1265	145,735.53	0.4360	6,137.00	0.0183
2,320.00	0.0601	10,600.00	0.2747	4,555.00	0.1180	21,280.00	0.5515	24,683.88	0.6398	11,375.00	0.2948
.....	.....	.....	.....	.....	.....	13.50	.....	.....	.....	.....	.....
<u>40,373.50</u>	.....	<u>19,595.00</u>	.....	<u>15,356.00</u>	.....	<u>64,385.50</u>	.....	<u>175,308.07</u>	.....	<u>18,447.00</u>	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	<u>116.00</u>	.....	<u>190.00</u>	.....	1,625.00	.....	362.78	.....	1,485.00	.....
.....	.....	<u>116.00</u>	.....	<u>190.00</u>	.....	<u>6,455.00</u>	.....	<u>1,422.50</u>	.....	<u>13,550.00</u>	.....
<u>8,552.32</u>	.....	<u>2,138.08</u>	.....	<u>3,608.08</u>	.....	<u>8,080.00</u>	.....	<u>1,785.28</u>	.....	<u>15,035.00</u>	.....
.....	.....	.....	.....	.....	.....	<u>12,962.00</u>	.....	<u>43,296.10</u>	.....	<u>668.15</u>	.....
1,360.00	.....	.....	.....	16,040.00	.....	.....	.....	.....	.....	.....	.....
725.00	.....	.....	.....	11,900.00	.....	3,080.50	.....	9,672.50	.....	.....	.....
<u>2,085.00</u>	.....	.....	.....	<u>27,940.00</u>	.....	<u>32,150.00</u>	.....	<u>55,280.00</u>	.....	.....	.....
.....	.....	.....	.....	.....	.....	<u>35,230.50</u>	.....	<u>64,952.50</u>	.....	.....	.....
99.00	.....	930.00	.....	910.00	.....	2,650.00	.....	3,332.00	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	







# QUEENSTON-CHIPPAWA DETAILS OF FIELD OVERHEAD COSTS

ELEMENT AND CLASSIFICATION	QUANTITIES	12 TIMEKEEPING	
		COSTS	UNIT COSTS
1. INTAKE			
SHEET PILING	187,089 Lin. Ft.	\$ 1,399.04	\$ 0.007
EARTH IN TEMPORARY DAM	139,120 Cu. Yds.	796.00	0.005
EARTH EXCAVATION	537,067 "	1,310.00	0.002
ROCK	"	2.00	"
CONCRETE	"	104.00	"
REINFORCED CONCRETE	"		"
TOTAL		<u>3,611.04</u>	
2. WELLAND RIVER			
EARTH EXCAVATION	1,194,637 Cu. Yds.	<u>2,620.00</u>	0.002
3. CANAL			
EARTH EXCAVATION, CANAL	9,651,557 Cu. Yds.	19,791.48	0.002
" " CONSTRUCTION RYS.	567,453 "		"
TOTAL EARTH EXCAVATION	10,219,010 "	<u>19,791.48</u>	
ROCK EXCAVATION CANAL	3,841,247 "	40,086.00	0.010
" " CONSTRUCTION RYS.	25,071 "		"
TOTAL ROCK EXCAVATION	3,866,318 "	<u>40,086.00</u>	
DREDGING	1,256,068 "	1,813.00	0.001
CONCRETE	304,299 "	26,310.00	0.086
STRUCTURAL STEEL, CONTROL GATE		236.00	"
RIP-RAP	986,028 "	<u>2,763.05</u>	0.002
TOTAL		<u>90,999.53</u>	
4. FOREBAY			
EARTH EXCAVATION	49,082 Cu. Yds.	70.00	0.001
ROCK	473,590 "	2,106.00	0.004
CONCRETE	6,440 "	917.00	0.142
TOTAL		<u>3,093.00</u>	
5. SCREEN HOUSE			
EARTH EXCAVATION	1,526 Cu. Yds.	5.61	0.003
ROCK	43,470 "	507.00	0.011
REINFORCED CONCRETE	29,522 "	6,617.10	0.224
STRUCTURAL STEEL		659.19	"
RACKS, GATES AND ICE CHUTE	1,449,826 Lbs.	285.60	0.000
TOTAL		<u>8,074.50</u>	
6. PENSTOCKS			
ROCK EXCAVATION	17,836 Cu. Yds.	613.00	0.034
CONCRETE	9,025 "	849.00	0.094
STEELWORK	1,833,350 Lbs.	2,069.00	0.000
TOTAL		<u>3,531.00</u>	
7. POWER HOUSE AND TAILRACE			
EARTH EXCAVATION	22,790 Cu. Yds.	69.16	0.003
ROCK	334,596 "	5,094.40	0.015
CONCRETE	38,584 "	8,331.60	0.215
STRUCTURAL STEEL		255.99	"
TOTAL		<u>13,751.15</u>	
7A. HYDRAULIC MACHINERY			
JOHNSON VALVES		2,017.40	"
TURBINES AND AUXILIARY EQUIPMENT		4,265.80	"
TOTAL		<u>6,283.20</u>	
7B. ELECTRICAL GENERATION AND PROPORTION OF		<u>6,360.40</u>	
8. BRIDGES			
TEMPORARY		3,348.36	"
PERMANENT		6,298.40	"
TOTAL		<u>9,646.76</u>	
9. RIGHT-OF-WAY			
9A. MISCELLANEOUS		660.00	"
10. QUEENSTON-POWER HOUSE RAILWAY			
11. PLANT SALVAGE			
12. STORES			
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS			
14. MISCELLANEOUS SALES AND WORK ORDERS			
15. SUSPENSE ACCOUNT			
16. BOND INTEREST			
GROSS TOTAL COST		\$ <u>148,630.58</u>	
LESS CREDIT REVENUE FROM INTERIM OPERATION			
NET TOTAL COST			

# POWER DEVELOPMENT AND CONSTRUCTION INTEREST TO MARCH 31<sup>ST</sup> 1922

**(13) COST KEEPING**

COSTS	UNIT COSTS
-------	------------

\$ 276.64	\$ 0.0016
158.00	0.0011
260.00	0.0005
0.50	...
20.00	...

715.14520.00 0.0004

3,928.08 0.0004

3,928.08

7,956.00 0.0021

7,956.00

359.50 0.0003

5,221.50 0.0172

46.50

548.39 0.0006

18,059.97

14.00 0.0003

418.00 0009

182.00 0.0283614.00

1.11 0.0007

99.90 0.0023

1,312.48 0.0445

131.65

56.20

1,601.34

121.50 0.0068

168.50 0.0187

411.00

701.00

13.73 0.0001

1,017.40 0.0034

1,658.80 0.0430

49.81

2,739.74

400.40

826.90

1,227.301,263.40

664.56

1,250.08

1,914.64

131.04

\$ 29,487.57**(14) EXPENSE  
SECURING LABOUR**

COSTS	UNIT COSTS
-------	------------

\$ 627.76	\$ 0.0033
359.00	0.0027
590.00	0.0011
1.00	...
44.00	...
1.25	...

1,623.011,180.00 0.0010

8,913.72 0.0009

8,913.72

18,054.00 0.0047

18,054.00

826.00 0.0007

11,849.30 0.0389

106.00

1,244.42 0.0013

40,993.44

31.20 0.0006

948.00 0.0020

413.00 0.06421,392.20

2.52 0.0017

226.80 0.0052

2,978.32 0.1008

296.88

128.60 0.0001

3,635.12

276.00 0.0155

383.90 0.0425

932.56 0.0001

1,592.46

31.15 0.0013

2,309.60 0.0068

3,752.40 0.0973

113.04

6,206.19

983.00

1,876.20

2,859.202,865.60

1,508.04

2,836.22

4,344.26

279.06

\$ 66,968.54**(15) CONSTRUCTION  
INTEREST**

COSTS	UNIT COSTS
-------	------------

\$ 9,485.48	\$ 0.0507
1,378.35	0.0099
20,111.22	0.0374
2.19	...
347.72	...
0.94	...

31,325.9035,411.90 0.0296

411,665.21 0.0427

411,665.21

453,937.85 0.1182

453,937.85

21,003.38

142,498.80 0.4685

52.78

26,388.67 0.0268

1,055,546.69

817.20 0.0167

49,849.04 0.1054

3,813.59 0.592454,479.83

8.58 0.0056

7,951.33 0.1829

19,755.34 0.6691

286.02

600.64 0.0004

28,601.91

4,358.38 0.2444

2,029.37 0.2248

422.23

6,809.98

794.05 0.0347

46,920.75 0.1400

23,965.67 0.6212

505.30

72,185.77

708.24

2,015.75

2,723.9965,283.45

16,180.50

57,367.27

73,547.77

1,361.99

\$ 1,427,279.18







# QUEENSTON-CHIPPAWA DETAILS OF ADMINISTRATIVE

ELEMENT AND CLASSIFICATION	QUANTITIES	①7 OFFICE ENGINEERING	
		COSTS	UNIT COSTS
1. INTAKE		\$ 1,920.43	\$ 0.010
SHEET PILING . . . . .	187,089 Lin. Ft.	1,107.70	0.008
EARTH IN TEMPORARY DAM . . . . .	139,120 Cu. Yds.	1,806.35	0.003
EARTH EXCAVATION . . . . .	537,067 "	2.95	...
ROCK " . . . . .		136.95	...
CONCRETE . . . . .			...
REINFORCED CONCRETE . . . . .			...
TOTAL . . . . .		<u>4,974.38</u>	...
2. WELLAND RIVER			
EARTH EXCAVATION . . . . .	1,194,637 Cu. Yds.	<u>3,613.90</u>	0.003
3. CANAL			
EARTH EXCAVATION, CANAL . . . . .	9,651,557 Cu. Yds.	27,313.06	0.002
" " CONSTRUCTION RYS. . . . .	567,453 "		...
TOTAL EARTH EXCAVATION . . . . .	10,219,010 "	<u>27,313.06</u>	...
ROCK EXCAVATION CANAL . . . . .	3,841,247 "	55,325.10	0.014
" " CONSTRUCTION RYS. . . . .	25,071 "		...
TOTAL ROCK EXCAVATION . . . . .	3,866,318 "	<u>55,325.10</u>	...
DREDGING . . . . .	1,256,068 "	2,410.30	0.001
CONCRETE . . . . .	304,299 "	36,315.35	0.119
STRUCTURAL STEEL, CONTROL GATE . . . . .		322.85	...
RIP-RAP . . . . .	986,028 "	<u>3,813.74</u>	0.003
TOTAL . . . . .		<u>125,500.40</u>	...
4. FOREBAY			
EARTH EXCAVATION . . . . .	49,082 Cu. Yds.	96.20	0.002
ROCK " . . . . .	473,590 "	2,908.25	0.006
CONCRETE . . . . .	6,440 "	<u>1,266.25</u>	0.196
TOTAL . . . . .		<u>4,270.70</u>	...
5. SCREEN HOUSE			
EARTH EXCAVATION . . . . .	1,526 Cu. Yds.	7.38	0.004
ROCK " . . . . .	43,470 "	694.30	0.016
REINFORCED CONCRETE . . . . .	29,522 "	9,123.26	0.309
STRUCTURAL STEEL . . . . .		909.57	...
RACKS, GATES AND ICE CHUTE . . . . .	1,449,826 Lbs.	393.95	0.000
TOTAL . . . . .		<u>11,128.46</u>	...
6. PENSTOCKS			
ROCK EXCAVATION . . . . .	17,836 Cu. Yds.	848.55	0.047
CONCRETE . . . . .	9,025 "	1,174.30	0.130
STEELWORK . . . . .	1,833,350 Lbs.	2,863.65	0.001
TOTAL . . . . .		<u>4,886.50</u>	...
7. POWER HOUSE AND TAILRACE			
EARTH EXCAVATION . . . . .	22,790 Cu. Yds.	95.57	0.004
ROCK " . . . . .	334,596 "	6,983.12	0.020
CONCRETE . . . . .	38,584 "	11,499.93	0.298
STRUCTURAL STEEL . . . . .		346.27	...
TOTAL . . . . .		<u>18,924.89</u>	...
7A. HYDRAULIC MACHINERY			
JOHNSON VALVES . . . . .		2,783.70	...
TURBINES AND AUXILIARY EQUIPMENT . . . . .		5,748.10	...
TOTAL . . . . .		<u>8,531.80</u>	...
7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE		<u>8,818.80</u>	...
8. BRIDGES			
TEMPORARY . . . . .		4,618.56	...
PERMANENT . . . . .		8,690.91	...
TOTAL . . . . .		<u>13,309.47</u>	...
9. RIGHT-OF-WAY			
9A. MISCELLANEOUS . . . . .		920.78	...
10. QUEENSTON-POWER HOUSE RAILWAY . . . . .			...
11. PLANT SALVAGE . . . . .			...
12. STORES . . . . .			...
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS . . . . .			...
14. MISCELLANEOUS SALES AND WORK ORDERS . . . . .			...
15. SUSPENSE ACCOUNT . . . . .			...
16. BOND INTEREST . . . . .			...
GROSS TOTAL COST . . . . .		\$ <u>204,880.08</u>	...
LESS CREDIT REVENUE FROM INTERIM OPERATION . . . . .			...
NET TOTAL COST . . . . .			...

HYDRO-ELECTRIC INQUIRY COMMISSION  
WALTER J. FRANCIS & COMPANY, TORONTO  
CONSULTING ENGINEERS MAY 2<sup>ND</sup> 1923







# QUEENSTON-CHIPPAWA

## DETAILS OF HEAD OFFICE

ELEMENT AND CLASSIFICATION	QUANTITIES	(23) EXECUTIVE SALARIES AND EXPENSES		(24) OFFICERS, ASSISTANTS AND EXPENSES	
		COSTS	UNIT COSTS	COSTS	UNIT COST
1. INTAKE					
SHEET PILING	187,089 Lin.Ft.	\$ 828.00	\$0.0044	\$ 539.00	\$0.002
EARTH IN TEMPORARY DAM	139,120 Cu.Yds.	431.00	0.0031	279.00	0.002
EARTH EXCAVATION	537,067 "	789.00	0.0015	514.00	0.000
ROCK	"	1.00	"	"	"
CONCRETE	"	41.00	"	30.00	"
REINFORCED CONCRETE	"	"	"	"	"
TOTAL	"	<u>2,090.00</u>	"	<u>1,362.00</u>	"
2. WELLAND RIVER					
EARTH EXCAVATION	1,194,637 Cu.Yds.	<u>1,632.00</u>	0.0013	<u>1,061.00</u>	0.000
3. CANAL					
EARTH EXCAVATION, CANAL	9,651,557 Cu.Yds.	15,262.00	0.0016	9,934.00	0.001
" " CONSTRUCTION RYS.	567,453 "	"	"	"	"
TOTAL EARTH EXCAVATION	10,219,010 "	<u>15,262.00</u>	"	<u>9,934.00</u>	"
ROCK EXCAVATION CANAL	3,841,247 "	27,491.00	0.0071	17,874.00	0.004
" " CONSTRUCTION RYS.	25,071 "	"	"	"	"
TOTAL ROCK EXCAVATION	3,866,318 "	<u>27,491.00</u>	"	<u>17,874.00</u>	"
DREDGING	1,256,068 "	1,224.00	0.0010	800.00	0.000
CONCRETE	304,299 "	15,406.00	0.0506	10,027.00	0.032
STRUCTURAL STEEL, CONTROL GATE	"	111.00	"	72.00	"
RIP-RAP	986,028 "	1,703.00	0.0017	1,109.00	0.001
TOTAL	"	<u>61,197.00</u>	"	<u>39,836.00</u>	"
4. FOREBAY					
EARTH EXCAVATION	49,082 Cu.Yds.	43.00	0.0009	28.00	0.000
ROCK	473,590 "	1,330.00	0.0028	866.00	0.001
CONCRETE	6,440 "	513.00	0.0791	334.00	0.051
TOTAL	"	<u>1,886.00</u>	"	<u>1,228.00</u>	"
5. SCREEN HOUSE					
EARTH EXCAVATION	1,526 Cu.Yds.	3.00	0.0020	2.00	0.001
ROCK	43,470 "	313.00	0.0072	204.00	0.004
REINFORCED CONCRETE	29,522 "	3,657.00	0.1239	2,380.00	0.080
STRUCTURAL STEEL	"	323.00	"	210.00	"
RACKS, GATES AND ICE CHUTE	1,449,826 Lbs.	176.00	0.0001	115.00	0.000
TOTAL	"	<u>4,472.00</u>	"	<u>2,911.00</u>	"
6. PENSTOCKS					
ROCK EXCAVATION	17,836 Cu.Yds.	365.00	0.0205	238.00	0.013
CONCRETE	9,025 "	787.00	0.0872	512.00	0.056
STEELWORK	1,833,350 Lbs.	1,194.00	0.0006	777.00	0.000
TOTAL	"	<u>2,346.00</u>	"	<u>1,527.00</u>	"
7. POWER HOUSE AND TAILRACE					
EARTH EXCAVATION	22,790 Cu.Yds.	42.00	0.0019	28.00	0.001
ROCK	334,596 "	3,236.00	0.0097	2,106.00	0.006
CONCRETE	38,584 "	4,802.00	0.1245	3,026.00	0.078
STRUCTURAL STEEL	"	138.00	"	90.00	"
TOTAL	"	<u>8,218.00</u>	"	<u>5,250.00</u>	"
7A. HYDRAULIC MACHINERY					
JOHNSON VALVES	"	965.00	"	628.00	"
TURBINES AND AUXILIARY EQUIPMENT	"	2,128.00	"	1,385.00	"
TOTAL	"	<u>3,093.00</u>	"	<u>2,013.00</u>	"
7B. ELECTRICAL GENERATION AND PROPORTION OF SUPERSTRUCTURE					
"	"	<u>3,756.26</u>	"	<u>2,430.52</u>	"
8. BRIDGES					
TEMPORARY	"	1,682.00	"	1,095.00	"
PERMANENT	"	3,543.00	"	2,206.00	"
TOTAL	"	<u>5,225.00</u>	"	<u>3,301.00</u>	"
9. RIGHT-OF-WAY					
9A. MISCELLANEOUS	"	401.00	"	261.00	"
10. QUEENSTON-POWER HOUSE RAILWAY					
11. PLANT SALVAGE					
12. STORES					
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS					
14. MISCELLANEOUS SALES AND WORK ORDERS					
15. SUSPENSE ACCOUNT					
16. BOND INTEREST					
GROSS TOTAL COST		\$ <u>94,316.26</u>		\$ <u>61,180.52</u>	
LESS CREDIT REVENUE FROM INTERIM OPERATION					
NET TOTAL COST					

TO MARCH 31<sup>ST</sup> 1922

25 GEN. EXPENSES HEAD OFFICE MAINTENANCE			26 OFFICE ENGINEERING			27 FIELD ENGINEERING			28 CONSULTING SERVICES			29 FIELD SUPERIN- TENDENCE			30 PURCHASING		
COSTS	UNIT COSTS		COSTS	UNIT COSTS		COSTS	UNIT COSTS		COSTS	UNIT COSTS		COSTS	UNIT COSTS		COSTS	UNIT COSTS	
\$ 4,355.12	\$ 0.0232		\$ 1,429.00	\$ 0.0076		\$ 75.00	\$ 0.0004		\$ 1,707.00	\$ 0.0091		\$ 170.00	\$ 0.0009		\$ 710.00	\$ 0.0038	
2,243.11	0.0162		736.00	0.0051		39.00	0.0003		879.00	0.0063		90.00	0.0006		366.00	0.0026	
4,151.82	0.0078		1,362.00	0.0025		72.00	0.0001		1,627.00	0.0031		160.00	0.0003		677.00	0.0012	
5.99	...		2.00	...		...	...		2.00	...		...	...		1.00	...	
239.05	...		78.00	...		4.00	...		93.00	...		10.00	...		39.00	...	
<u>10,995.04</u>	...		<u>3,607.00</u>	...		<u>190.00</u>	...		<u>4,308.00</u>	...		<u>430.00</u>	...		<u>1,793.00</u>	...	
8,585.60	0.0072		2,816.00	0.0023		148.00	0.0001		3,363.00	0.0028		340.00	0.0003		1,400.00	0.0011	
80,284.00	0.0014		26,341.00	0.0027		1,384.00	0.0001		31,569.00	0.0032		3,190.00	0.0003		13,095.00	0.0014	
<u>80,284.00</u>	...		<u>26,341.00</u>	...		<u>1,384.00</u>	...		<u>31,569.00</u>	...		<u>3,190.00</u>	...		<u>13,095.00</u>	...	
144,704.00	0.0376		47,246.00	0.0126		2,583.00	0.0007		56,663.00	0.0147		5,750.00	0.0015		23,587.00	0.0061	
<u>144,704.00</u>	...		<u>47,246.00</u>	...		<u>2,583.00</u>	...		<u>56,663.00</u>	...		<u>5,750.00</u>	...		<u>23,587.00</u>	...	
6,538.10	0.0052		2,113.00	0.0017		111.00	0.0001		2,523.00	0.0020		260.00	0.0002		1,050.00	0.0008	
81,045.00	0.2663		26,534.00	0.0872		1,398.00	0.0046		31,954.00	0.1050		3,220.00	0.0106		13,218.00	0.0434	
584.83	...		192.00	...		10.00	...		229.00	...		20.00	...		95.00	...	
9,059.00	0.0092		2,940.00	0.0030		154.00	0.0001		3,511.00	0.0036		360.00	0.0004		1,461.00	0.0015	
<u>322,214.93</u>	...		<u>105,366.00</u>	...		<u>5,640.00</u>	...		<u>126,539.00</u>	...		<u>12,800.00</u>	...		<u>52,506.00</u>	...	
225.20	0.0046		74.00	0.0015		4.00	0.0001		88.00	0.0018		10.00	0.0002		37.00	0.0008	
7,096.10	0.0150		2,296.00	0.0048		121.00	0.0003		2,742.00	0.0057		280.00	0.0006		1,141.00	0.0024	
2,700.61	0.4163		886.00	0.1366		47.00	0.0073		1,058.00	0.1631		110.00	0.0171		440.00	0.0678	
<u>10,021.91</u>	...		<u>3,256.00</u>	...		<u>172.00</u>	...		<u>3,888.00</u>	...		<u>400.00</u>	...		<u>1,618.00</u>	...	
13.86	0.0091		4.00	0.0026		...	...		5.00	0.0032		...	...		2.00	0.0013	
1,648.61	0.0378		541.00	0.0125		29.00	0.0007		646.00	0.0149		60.00	0.0014		269.00	0.0062	
19,240.24	0.6518		6,312.00	0.2158		332.00	0.0113		7,538.00	0.2554		760.00	0.0257		3,138.00	0.1059	
1,699.16	...		557.00	...		29.00	...		666.00	...		70.00	...		277.00	...	
928.59	0.0006		305.00	0.0002		16.00	...		364.00	0.0002		40.00	...		151.00	0.0001	
<u>23,530.46</u>	...		<u>7,719.00</u>	...		<u>406.00</u>	...		<u>9,219.00</u>	...		<u>930.00</u>	...		<u>3,837.00</u>	...	
1,921.02	0.1077		630.00	0.0353		33.00	0.0018		753.00	0.0424		80.00	0.0045		313.00	0.0176	
4,141.46	0.4591		1,360.00	0.1508		71.00	0.0079		1,623.00	0.1799		160.00	0.0177		675.00	0.0748	
6,277.89	0.0034		2,060.00	0.0011		108.00	0.0001		2,460.00	0.0013		250.00	0.0001		1,024.00	0.0006	
<u>12,340.37</u>	...		<u>4,050.00</u>	...		<u>212.00</u>	...		<u>4,836.00</u>	...		<u>490.00</u>	...		<u>2,012.00</u>	...	
224.32	0.0101		73.00	0.0033		4.00	0.0002		88.00	0.0039		10.00	0.0005		36.00	0.0016	
17,022.64	0.0508		5,585.00	0.0167		294.00	0.0009		6,670.00	0.0199		680.00	0.0020		2,777.00	0.0083	
25,260.45	0.6546		8,288.00	0.2148		436.00	0.0113		9,898.00	0.2564		1,000.00	0.0259		4,120.00	0.1068	
726.87	...		239.00	...		12.00	...		285.00	...		30.00	...		119.00	...	
<u>43,234.28</u>	...		<u>14,185.00</u>	...		<u>746.00</u>	...		<u>16,941.00</u>	...		<u>1,720.00</u>	...		<u>7,052.00</u>	...	
5,074.54	...		1,665.00	...		87.00	...		1,989.00	...		200.00	...		828.00	...	
11,195.60	...		3,674.00	...		193.00	...		4,387.00	...		440.00	...		1,826.00	...	
<u>16,270.14</u>	...		<u>5,339.00</u>	...		<u>280.00</u>	...		<u>6,376.00</u>	...		<u>640.00</u>	...		<u>2,654.00</u>	...	
<u>19,886.04</u>	...		<u>6,407.72</u>	...		<u>338.80</u>	...		<u>7,733.46</u>	...		<u>736.52</u>	...		<u>3,240.69</u>	...	
8,851.30	...		2,903.00	...		153.00	...		3,468.00	...		350.00	...		1,444.00	...	
<u>18,635.92</u>	...		<u>6,105.00</u>	...		<u>321.00</u>	...		<u>7,316.00</u>	...		<u>740.00</u>	...		<u>3,040.00</u>	...	
<u>27,487.22</u>	...		<u>9,008.00</u>	...		<u>474.00</u>	...		<u>10,784.00</u>	...		<u>1,090.00</u>	...		<u>4,484.00</u>	...	
2,112.00	...		693.00	...		36.00	...		827.00	...		80.00	...		343.00	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...	...		...	...		...	...		...	...	
...	...		...	...		...											







QUEENSTON-CHIPPAWA  
DETAILS OF HEAD OFFICE

(31) TIMEKEEPING

ELEMENT AND CLASSIFICATION		QUANTITIES		COSTS	UNIT COSTS
1. INTAKE					
	SHEET PILING	187,089	Lin.Ft.	\$ 279.00	\$0.0015
	EARTH IN TEMPORARY DAM	139,120	Cu.Yds.	144.00	0.0014
	EARTH EXCAVATION	537,067	"	266.00	0.0005
	ROCK				
	CONCRETE			15.00	
	REINFORCED CONCRETE				
	TOTAL			<u>704.00</u>	
2. WELLAND RIVER					
	EARTH EXCAVATION	1,194,637	Cu.Yds.	<u>550.00</u>	0.0005
3. CANAL					
	EARTH EXCAVATION, CANAL	9,651,557	Cu.Yds.	5,223.00	0.0005
	" " CONSTRUCTION RYS.	567,453	"		
	TOTAL EARTH EXCAVATION	10,219,010	"	<u>5,223.00</u>	
	ROCK EXCAVATION CANAL	3,841,247	"	9,272.00	0.0024
	" " CONSTRUCTION RYS.	25,071	"		
	TOTAL ROCK EXCAVATION	3,866,318	"	<u>9,272.00</u>	
	DREDGING	1,256,068	"	413.00	0.0003
	CONCRETE	304,299	"	5,196.00	0.0171
	STRUCTURAL STEEL, CONTROL GATE			37.00	
	RIP-RAP	986,028	"	<u>574.00</u>	0.0006
	TOTAL			<u>20,715.00</u>	
4. FOREBAY					
	EARTH EXCAVATION	49,082	Cu.Yds.	14.00	0.0003
	ROCK	473,590	"	449.00	0.0009
	CONCRETE	6,440	"	<u>173.00</u>	0.0268
	TOTAL			<u>636.00</u>	
5. SCREEN HOUSE					
	EARTH EXCAVATION	1,526	Cu.Yds.	1.00	0.0007
	ROCK	43,470	"	106.00	0.0025
	REINFORCED CONCRETE	29,522	"	1,233.00	0.0418
	STRUCTURAL STEEL			109.00	
	RACKS, GATES AND ICE CHUTE	1,449,826	Lbs.	59.00	0.0001
	TOTAL			<u>1,508.00</u>	
6. PENSTOCKS					
	ROCK EXCAVATION	17,836	Cu.Yds.	123.00	0.0069
	CONCRETE	9,025	"	265.00	0.0294
	STEELWORK	1,833,350	Lbs.	<u>402.00</u>	0.0002
	TOTAL			<u>790.00</u>	
7. POWER HOUSE AND TAILRACE					
	EARTH EXCAVATION	22,790	Cu.Yds.	15.00	0.0007
	ROCK	334,596	"	1,091.00	0.0033
	CONCRETE	38,584	"	1,620.00	0.0420
	STRUCTURAL STEEL			46.00	
	TOTAL			<u>2,772.00</u>	
7A. HYDRAULIC MACHINERY					
	JOHNSON VALVES			325.00	
	TURBINES AND AUXILIARY EQUIPMENT			718.00	
	TOTAL			<u>1,043.00</u>	
7B. ELECTRICAL GENERATION AND PROPORTION OF					
	SUPERSTRUCTURE			<u>1,252.08</u>	
8. BRIDGES					
	TEMPORARY			567.00	
	PERMANENT			<u>1,195.00</u>	
	TOTAL			<u>1,762.00</u>	
9. RIGHT-OF-WAY					
	MISCELLANEOUS			135.00	
10. QUEENSTON-POWER HOUSE RAILWAY					
11. PLANT SALVAGE					
12. STORES					
13. EXPENDITURES, SALVAGING PLANT AND MATERIALS					
14. MISCELLANEOUS SALES AND WORK ORDERS					
15. SUSPENSE ACCOUNT					
16. BOND INTEREST					
GROSS TOTAL COST				\$ <u>31,867.08</u>	
LESS CREDIT REVENUE FROM INTERIM OPERATION					
NET TOTAL COST					

TO MARCH 31<sup>ST</sup> 1922

32

COST  
KEEPING

COSTS	UNIT COSTS
\$88.00	\$0.0005
45.00	0.0003
83.00	0.0001
5.00	...
221.00	...
173.00	0.0001
1,620.00	0.0002
1,620.00	...
2,917.00	0.0008
2,917.00	...
130.00	0.0001
1,635.00	0.0054
11.00	...
181.00	0.0002
6,494.00	...
5.00	0.0001
141.00	0.0003
54.00	0.0083
200.00	...
33.00	0.0008
388.00	0.0131
34.00	...
19.00	...
474.00	...
39.00	0.0022
83.00	0.0092
127.00	0.0001
249.00	...
5.00	0.0002
343.00	0.0010
509.00	0.0132
15.00	...
872.00	...
102.00	...
226.00	...
328.00	...
397.72	...
178.00	...
376.00	...
554.00	...
42.00	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...
...	...





Subdivision of the Tables.

As already stated, the subdivisions of the principal headings of the tables have been marked by designating numbers. These subdivisions, or columns, will now be explained in order.

Direct Costs.

Column No. 1, "Materials and Permanent Machinery", being the first subdivision of Direct Costs, shows the capital expenditure for materials and permanent machinery laid down in the stores, together with the labour necessary to place them on the ground ready for use. In addition to the labour for handling the above mentioned materials and permanent machinery, there is also included in this item a charge for plant used for handling the same as well as a proportion of the overhead charges on stores. The stores overhead charges are made up and allocated, having regard to the value of the goods placed therein. The material charges include also freight, duty, sales tax and all other charges contingent upon the purchase. The amount for labour, overhead and other charges included in Column No. 1, over and above the invoice amounts for materials and machinery, has been taken at ten per cent. of the value of the materials and machinery as invoiced. The subdivision of the ten per cent. charge is approximately three per cent. for labour, four per cent. for materials and handling, and three per cent. for plant used in handling.

As in the case of plant set forth in the description of the composition of Column No. 3, the balance of the cost of materials and permanent machinery,





over and above the total of \$12,673,879.02 for the column, has been absorbed in the other columns to the extent in which it was used therein, column by column. The total expenditure for materials and permanent machinery as shown by the invoices up to March 31st, 1922, is \$21,439,855.46.

Column No. 2. "Labour", includes all the direct labour costs, together with the charges under the Workmen's Compensation Act, in connection with the repair work, maintenance and temporary work carrying out of the permanent work. It includes also the wages of walking-bosses, for and heavy work on the items described in Column No. 1, bosses, foremen and sub-foremen.

The total amount of direct labour costs as shown by Column No. 2 and not distributed elsewhere is \$11,899,170.33 while the amount absorbed in the other subdivisions of the tables is \$6,314,776.32, allocated according to the actual distribution for each column, column by column, and as determined from the records.

Column No. 3. "Plant", is the cost of the construction plant, temporary buildings and so forth, less the salvage value thereof.

The cost of the construction plant, temporary buildings and so forth, as at March 31st, 1922, is shown on the records of the Commission to be \$17,586,157.94, while the plant salvage value on the same, as at March 31st, 1922, was placed at \$2,958,829.08, the difference being \$14,627,328.86. Of this amount \$9,014,082.44 has been charged into Column No. 3, "Plant", as a direct cost, the balance having been absorbed into the following columns: Column No. 1, "Materials and Permanent Machinery", as already mentioned; Column No. 4, "Construction Superintendence", allowing for such items as automobiles, speeders and so forth, and housing; Column No. 5, "Power,

and above the total of \$11,478,879.00 for the ...  
... ..  
The total expenditures for materials and permanent machinery as shown  
... ..  
... ..

... ..  
... ..  
... ..  
... ..  
... ..

The total amount of direct labor costs as shown by Column No. 1 and not  
... ..  
... ..  
... ..  
... ..

... ..  
... ..  
... ..  
... ..

... ..  
... ..  
... ..  
... ..

... ..  
... ..  
... ..  
... ..



Light and Telephone", allowing for maintenance, power light and telephone lines; Column No. 6, "Compressed Air", for compressors, air lines and so forth; Column No. 7, "Water Supply", for pumps and pipe line; Column No. 8, "Garage and Stables", for plant for automobile repairs and buildings in connection therewith; Column No. 9, "Sanitation and Camps", for buildings and in transportation service; Column No. 10, "Plant Repairs", for emergency repair shop, maintenance and temporary buildings; Column No. 11, "Miscellaneous", for equipment used in the items described thereunder; Column No. 12, "Timekeeping", principally for housing and services; Column No. 13, "Cost-keeping", principally for housing and services; Column No. 17, "Office Engineering", principally for housing and services; Column No. 18, "Field Engineering", for transportation and housing; Column No. 19, "Cost-keeping", principally for housing and services; Column No. 20, "Accounting", for housing; Column No. 21, "Stenography", for housing; Column No. 39, "Unwatering", for pumps, motive apparatus, piping, flumes and so forth; Column No. 40, "Contingencies", for transportation and pumping plant charges during the strike delay; Column No. 41, "Hospital and Medical Services", for transportation and housing; Column No. 42, "Main Line Railways and Roads", for railway equipment, temporary buildings, signal systems and rotary converters used in the construction of the railroads; and Column No. 43, "Miscellaneous Items", for transportation, housing and miscellaneous small plant items.

Column No. 4, "Construction Superintendence", includes all charges for superintendence which would normally be done by a general contractor. It includes the salary of Mr. Goodwin, of Mr. Angell and of all the superintendents, together with that of their direct staffs, and the proportion of



...together with that of their direct estate, and the proportion of ... the estate of Mr. ... and of all the ... which would normally be done by a general contractor. It ...

transportation and housing chargeable thereto.

Field Service Costs.

Column No. 5, "Power, Light and Telephone", covers the charges in connection with the power, light and telephone service, and includes the cost of all labour, equipment and power rental, and of all materials for construction, operation and maintenance thereof, and the proportion of transportation, plant and housing chargeable thereto.

Column No. 6, "Compressed Air", represents the costs for compressed air service, and includes the cost therefor on a basis similar to that described for the power, light and telephone service.

Column No. 7, "Water Supply", gives the cost of the water supply for the various boilers, concrete mixers and other parts of the construction plant, as well as the domestic supply of the work camps, garage and stables and for the fire system.

Column No. 8, "Garage and Stables", includes all the charges for the garage and stables, being the cost of the buildings, construction, operation and maintenance of same, less the salvage value. It includes also the capital cost of the motor vehicles, wagons and horses less their present value.

Column No. 9, "Sanitation and Camps", refers to all charges for sanitation and camps. It includes all construction costs of camp buildings less their salvage value, and in addition it includes the operation and maintenance of the camps, as well as the equipment and operation of the sanitary system.

Transportation and storage of materials.

Construction of buildings.

Section 1. "Power, Light and Telephone" covers the charges in connection with the power, light and telephone service, and includes the cost of all labor, equipment and materials used in the construction, operation and maintenance thereof, and the cost of the telephone service.

Section 2. "Compressed Air" represents the costs for compressed air used in the construction and operation of the project.

Section 3. "Water Supply" covers the cost of the water supply for the project, including the cost of the water supply system, as well as the cost of the water supply system, and the cost of the water supply system.

Section 4. "Construction of Buildings" covers the cost of the construction of buildings, including the cost of the construction of buildings, and the cost of the construction of buildings.

Section 5. "Construction of Buildings" covers the cost of the construction of buildings, including the cost of the construction of buildings, and the cost of the construction of buildings.



Column No. 10, "Plant Repairs", includes the cost of all labour and materials for repairs to the construction plant and a proportion of the machines and housing therefor used in performing the same.

Column No. 11, "Miscellaneous", includes the cost of those field services not included in Columns Nos. 5 to 10, being such charges as moving the construction plant out of the Canal, the temporary end wall of the Power House, and crane operation in the Screen House and Power House.

Field Overhead Costs.

Column No. 12, "Timekeeping", includes all the costs for timekeeping up to and including the Pay Master's duties.

Column No. 13, "Cost-keeping", includes all the cost of cost-keeping which would ordinarily be done by a general contractor.

Column No. 14, "Expense Securing Labour", includes all items in connection with the engagement of labour, mechanics and foremen, as well as labour agency fees and loss on guaranteed transportation.

Construction Interest.

Column No. 15, "Construction Interest", is an allowance for interest in carrying out the construction work set forth under the head of "Direct Costs and Field Service Costs", and is intended to represent interest charges which a general contractor would probably be called upon to pay in financing the assumed contract. The rate assumed for this portion of the interest charges



100-10000

Under the terms of the contract, the University of Chicago is to provide the necessary equipment and materials for the project. The project is to be completed by the end of the year.

The project is to be completed by the end of the year. The project is to be completed by the end of the year. The project is to be completed by the end of the year.

Small Business

Section 1.1. The project is to be completed by the end of the year. The project is to be completed by the end of the year. The project is to be completed by the end of the year.

Section 1.2. The project is to be completed by the end of the year. The project is to be completed by the end of the year. The project is to be completed by the end of the year.

Section 1.3. The project is to be completed by the end of the year. The project is to be completed by the end of the year. The project is to be completed by the end of the year.

Section 1.4

Section 1.5. The project is to be completed by the end of the year. The project is to be completed by the end of the year. The project is to be completed by the end of the year.

is 6 per cent. per annum, financing for monthly progress estimates in the usual way. The part of the total charges for interest thus absorbed into direct costs is \$1,427,279.18. The balance of the interest amounting to \$4,712,127.55 is set down at the end of the table under the side caption "Bond Interest". The total amount of interest charges up to March 31st, 1922, is shown on the books of the Hydro-Electric Power Commission as \$6,139,406.73, all of which we are informed has been duly audited by Mr. Clarkson.

Direct Costs, Field Service Costs, Field Overhead Costs and Construction Interest.

Column No. 16. "Direct, Field Service, Field Overhead and Construction Interest", is a summation of the previous fifteen columns and is intended to indicate the total of the direct costs, field service costs, field overhead costs and construction interest which a general contractor would be called upon to bear in constructing the development. In figuring this column, the cost of the turbines, generators and other permanent plant has been included. With regard to these items it has been considered that the contracts for the permanent machinery would be in the usual form, and that the general contractor for the work would not be called upon to carry the construction interest charges therefor, the manufacturer being paid up on the completion of his order.

Administrative Field Overhead Costs.

Column No. 17. "Office Engineering", represents the costs for office engineering in the field as carried out by the owner in accordance with standard practice.





Column No. 18, "Field Engineering", represents the cost of the field engineering as carried out by the owner in accordance with standard practice.

Column No. 19, "Cost-keeping", gives the expenses connected with cost-keeping, such as would be done by the field staff of the owner in accordance with standard practice.

Column No. 20, "Accounting", gives the expenses connected with accounting which was done by the field staff of the owner in accordance with standard practice, and is in reality the accounting expense in the early stages of the work prior to the time when this branch came under the jurisdiction of Mr. Pierdon at the head office of the Hydro-Electric Power Commission in Toronto.

Column No. 21, "Stenography", gives the total costs for stenography for the field forces of the owner.

Column No. 22, "Total Administrative Field Overhead Costs", gives the total administrative field overhead costs of the field office staff in connection with the development.

Head Office Overhead Costs.

Columns Nos. 23 to 37, inclusive, show the various items of head office overhead costs while Column No. 38 shows their total. These columns show the totals of the records as allocated in head office books, and may be considered as the overhead costs of the owner in connection with the development. The subdivisions are as follows:



10-44

...the ... of the ...

...the ... of the ...

...the ... of the ...

COPY

...the ... of the ...

...the ... of the ...

...the ... of the ...

...the ... of the ...

...the ... of the ...

<u>Column</u>	<u>Title</u>
23	Executive Salaries and Expenses
24	Officers' and Assistants' Salaries and Expenses
25	General Expense, Head Office Maintenance
26	Office Engineering
27	Field Engineering
28	Consulting Services
29	Field Superintendence
30	Purchasing
31	Timekeeping
32	Cost-keeping
33	Accounting
34	Auditing
35	Stenography
36	Laboratories
37	Insurance and Taxes
38	Total Head Office Overhead Costs

23	Executive Salaries and Expenses
24	Officers' and Assistants' Salaries and Expenses
25	General Expense, Head Office Maintenance
26	Office Engineering
27	Field Engineering
28	Consulting Services
29	Field Superintendence
30	Purchasing
31	Timekeeping
32	Cost-keeping
33	Accounting
34	Auditing
35	Stenography
36	Laboratories
37	Insurance and Taxes
38	Total Head Office Overhead Costs

COPY

Unwatering.

Column No. 39, "Unwatering", gives the total cost of the unwatering during the progress of construction up to March 31st, 1922. It includes a proportion of the construction plant together with labour and materials for the operation and maintenance of same.

Contingencies (Strike).

Column No. 40, "Contingencies (Strike)", includes what is considered by the engineers of the Hydro-Electric Power Commission to be the direct ascertainable loss arising out of the 1920 labour strike. The vastly greater indirect losses, considered by them to be unascertainable, are included in the direct construction costs.

Line	Rate
10	10.00
11	11.00
12	12.00
13	13.00
14	14.00
15	15.00
16	16.00
17	17.00
18	18.00
19	19.00
20	20.00
21	21.00
22	22.00
23	23.00
24	24.00
25	25.00
26	26.00
27	27.00
28	28.00
29	29.00
30	30.00
31	31.00
32	32.00
33	33.00
34	34.00
35	35.00
36	36.00
37	37.00
38	38.00
39	39.00
40	40.00
41	41.00
42	42.00
43	43.00
44	44.00
45	45.00
46	46.00
47	47.00
48	48.00
49	49.00
50	50.00
51	51.00
52	52.00
53	53.00
54	54.00
55	55.00
56	56.00
57	57.00
58	58.00
59	59.00
60	60.00
61	61.00
62	62.00
63	63.00
64	64.00
65	65.00
66	66.00
67	67.00
68	68.00
69	69.00
70	70.00
71	71.00
72	72.00
73	73.00
74	74.00
75	75.00
76	76.00
77	77.00
78	78.00
79	79.00
80	80.00
81	81.00
82	82.00
83	83.00
84	84.00
85	85.00
86	86.00
87	87.00
88	88.00
89	89.00
90	90.00
91	91.00
92	92.00
93	93.00
94	94.00
95	95.00
96	96.00
97	97.00
98	98.00
99	99.00
100	100.00

COPY

10-1081

10-1081, "Unwatermark", gives the total cost of the material

being the lowest of material in the list, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081

10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081, 10-1081



Hospital and Medical Services.

Column No. 41, "Hospital and Medical Services", includes the cost of the medical and hospital service, being the salaries of the medical officers, hospital systems, hospital supplies, ambulance service, housing, and so forth.

Main Line Railways and Roads.

Column No. 42, "Main Line Railways and Roads", covers the capital costs of the main line railways, but not the cost of maintenance and operation of the same. It does not include the cost of loading tracks and disposal tracks, nor their operation and maintenance. It includes the construction cost of the main roads.

Miscellaneous Items.

Column No. 43, "Miscellaneous Items", includes miscellaneous items in connection with the development, being right-of-way, Queenston-Power House Railway, plant salvage, stores, expenditures on salvage, miscellaneous sales and work orders, and suspense account. Of these items plant salvage, stores, expenditures on salvage, and miscellaneous sales are considered by the engineers of the Hydro-Electric Power Commission as recoverable assets. A portion of the right-of-way in excess of the area immediately occupied by the development is similarly considered as a recoverable asset, either for resale or for use in a subsequent addition to the development.

The Right-of-Way has been fully dealt with in Chapter J, Quantities,



Section 1. General

The National Archives and Records Administration (NARA) is the principal agency in the Federal Government for the preservation and management of the records of the Federal Government. NARA is responsible for the preservation and management of the records of the Federal Government, including the records of the President of the United States, the records of the Executive Branch, the records of the Legislative Branch, and the records of the Judicial Branch.

Section 2. Records of the President of the United States

The records of the President of the United States are the records of the President's official activities, including the President's speeches, the President's correspondence, the President's appointments, and the President's decisions. The records of the President of the United States are the property of the United States and are preserved by NARA. The records of the President of the United States are the property of the United States and are preserved by NARA. The records of the President of the United States are the property of the United States and are preserved by NARA.

COPY

Section 3. Records of the Executive Branch

The records of the Executive Branch are the records of the activities of the Executive Branch, including the records of the President, the records of the Vice President, the records of the Cabinet, the records of the Executive Orders, and the records of the Executive Branch's decisions. The records of the Executive Branch are the property of the United States and are preserved by NARA. The records of the Executive Branch are the property of the United States and are preserved by NARA. The records of the Executive Branch are the property of the United States and are preserved by NARA.

The records of the Executive Branch are the property of the United States and are preserved by NARA.

Right-of-Way, and the same figures have been used.

The item 9 (a) "Miscellaneous" covers the clearing and grubbing work on the right-of-way.

The Queenston-Power House Railway is set down as a separate item of \$200,000, considered by the engineers of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

The item entitled "Plant Salvage (Miscellaneous Construction Plant, Buildings, Railways, Power and Telephone)" is the residual value of construction plant, buildings and so forth as estimated by the engineers of the Hydro-Electric Power Commission.

The item entitled "Stores" is the value of the stores on hand on March 31st, 1922, as estimated by the engineers of the Hydro-Electric Power Commission.

The item entitled "Expenditures Salvaging Plant and Materials" gives the amount of labour, plant rental and so forth already charged against construction plant and stores and considered as recoverable assets by the engineers of the Hydro-Electric Power Commission.

The item entitled "Miscellaneous Sales and Work Orders" gives the amount on the books of the Hydro-Electric Power Commission for miscellaneous items of work done and not paid for up to March 31st, 1922.

The item entitled "Bond Interest", \$4,712,127.55, is the balance of the total interest charge shown by the books of the Hydro-Electric Power Commission on the construction of the Queenston-Chippawa Power Development up to March 31st, 1922. This item represents the whole of the interest charges with the exception of that which has been absorbed in Column No. 15 indicating the

...and the same figures have been used.

The first of the items listed in the report is the ...

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

COPY

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.

The ...-Power House Railway is set down as a separate item of \$200,000, considered by the members of the Hydro-Electric Power Commission to be a fair estimate of the permanent plant value thereof.



interest on the contractor's cost of an assumed contract.

The credit item entitled "Revenue from Operation", amounting to \$192,975.70, is the net amount billed for commercial power delivered to the Niagara System by the Queenston-Chippawa Power Development up to March 31st, 1922.

\$192,975.70

Grand Total of All Expenditures.

Column No. 44, "Grand Total of All Expenditures", represents the grand total of all expenditures, from which the net total cost of development up to March 31st, 1922, will be seen to be \$62,182,623.65.

COPY

Unit Costs.

Throughout the columns previously described is a secondary column entitled "Unit Cost". This unit cost has been derived for each subdivision having regard to the quantity concerned and to the cost thereof in each department. In the total columns the unit cost is similarly derived from the foregoing total. It is thus possible to ascertain the unit cost, as far as it is practicable to do so, of each class of work in each element of the development which would be borne by a general contractor, and, similarly, by the owner. As the owner would ordinarily have a field office in addition to a head office, these unit costs have been so subdivided.

The Records of Labour and Material Costs.

The records of labour costs as appearing in the books of the Hydro-Electric



1999-2000

Interest in the subject's cost of an assigned contract.

THE UNIVERSITY OF CHICAGO LIBRARY

10. The first group listed the following items:

[illegible]

Downloaded At: 11:53 11 September 2009

Very truly yours,  
J. Edgar Hoover

Enclosure

On March 1954, will be seen to be 100,000,000.

COPY

THESE ARE THE NAMES OF THE VARIOUS GROUPS OF THE

© 2004 Blackwell Publishing Ltd *Journal of Internal Medicine* 255: 103–110

to the quantity consumed and to the cost thereof in each department. In the

1. *Can you identify any new political parties?*

Source: *Author's calculations* based on data from the 1990 Census of the United States.

of each class of work in each element of the development which would be

These data are all in good agreement with the results of the previous studies, and are in

..belivibere or need over

records to address

Power Commission have been derived from the reports of the timekeepers, in accordance with the system already set forth in the writer's former reports and in the reports of Messrs. Price, Waterhouse & Co.

The total amount of money expended for labour, in the net cost of \$62,182,623.65, is found to be \$20,213,946.87.

The expenditures for material have been recorded in the manner described in the previous reports.

#### Summary.

A summary of the total costs of the Queenston-Chippawa Tower Development up to March 31st, 1922, is as follows:

Intake .....	\$ 965,849.01
Welland River .....	913,907.78
Canal .....	35,937,700.62
Forebay .....	1,133,479.03
Screen House .....	1,563,721.61
Penstocks .....	895,205.90
Power House .....	2,703,998.93
Hydraulic Machinery .....	1,697,108.31
Electrical Generation and Proportion of Superstructure .....	3,214,413.15
Bridges, Temporary and Permanent .....	2,138,257.92
Right-of-Way .....	1,423,591.58
Miscellaneous .....	124,971.10
Queenston-Power House Railway .....	200,000.00
Plant Salvage .....	2,958,829.08
Stores .....	1,626,576.36
Expenditures Salvaging Plant and Materials .....	104,705.18
Miscellaneous Stores and Work Orders .....	58,359.30
Suspense Account .....	3,096.94
Bond Interest .....	4,712,127.55
Gross Total Cost .....	\$62,375,599.35
Less Credit, Revenue from Interim Operation .....	192,975.70
Net Total Cost .....	<u>\$62,182,623.65</u>





The foregoing analysis gives the unit costs derived from a consideration of the quantities for the principal classifications of work and the total costs thereof, first, on the usual basis of the costs to a general contractor carrying out the work, and, second, to the owner by the addition of the administrative field overhead and the head office overhead costs not ordinarily borne by a contractor. The first case is given in dollars per cubic yard of completed work in the column marked "A" below, which embraces "Direct Costs", "Field Service Costs" and "Field Overhead Costs", (Columns Nos. 1 to 15 inclusive, or Column No. 16); while the second case is given in similar terms in the column marked "B", which in addition to the costs contained in column "A" embraces "Administrative Field Overhead Costs" and "Head Office Overhead Costs" (Columns Nos. 17 to 37 inclusive, or the sum of Columns Nos. 16, 22 and 38).

Derived Unit Costs of the Principal Classifications of Work

Work and Location of Same	Unit Costs in Dollars per Cubic Yard	
	Column "A"	Column "B"
	"Contractor's Cost"	"Owner's Cost"
<b>Earth Excavation Work:</b>		
Intake .....	0.7645	0.8059
Welland River .....	0.7178	0.7559
Canal .....	0.8087	0.8504
Canal Dredging .....	0.7586	0.7852
Forebay .....	0.5056	0.5301
Screen House .....	1.2646	1.3174
Power House .....	0.8782	0.9216
Average of all Earth Excavation Work ...	0.7924	0.8323
<b>Rock Excavation Work:</b>		
Canal .....	3.5635	3.7580
Forebay .....	1.6829	1.7611
Screen House .....	3.6788	3.8803
Penstocks .....	9.3318	9.9128
Power House .....	3.2512	3.5196
Average of all Rock Excavation Work .....	3.3752	3.5647



[illegible]

COPY

Derived Unit Costs of the Principal Classifications of Work (Continued)

Work and Location of Same	Unit Costs in Dollars per Cubic Yard	
	Column "A"	Column "B"
	"Contractor's Cost"	"Owner's Cost"
<b>Concrete Work:</b>		
<b>Plain Concrete:</b>		
Canal Lining .....	\$ 21.5296	\$ 22.9704
Forebay .....	28.0318	30.3328
Penstocks .....	19.8362	22.0369
Power House .....	30.1969	33.7597
Average of all Plain Concrete Work ...	22.5370	24.2412
<b>Reinforced Concrete:</b>		
Screen House .....	35.2118	38.8018
Average of all Reinforced Concrete Work .....	35.2118	38.8018

COPY

The average costs of the four classifications of work above set forth have been derived having regard to the total quantity in each element and the total cost thereof.

Walter J. Francis  
Consulting Engineer.

Toronto, May 2nd, 1923.

(10-10)

Received from the International Department of the Western Union Telegraph & Cable Company

THE WESTERN UNION TELEGRAPH & CABLE COMPANY  
NEW YORK, N.Y.

NEW YORK, N.Y.

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

COPY

The message was received at New York, N.Y., on the 10th day of the month of May, 1911.

The message was received at New York, N.Y., on the 10th day of the month of May, 1911.

RECEIVED

RECEIVED

RECEIVED

RECEIVED











